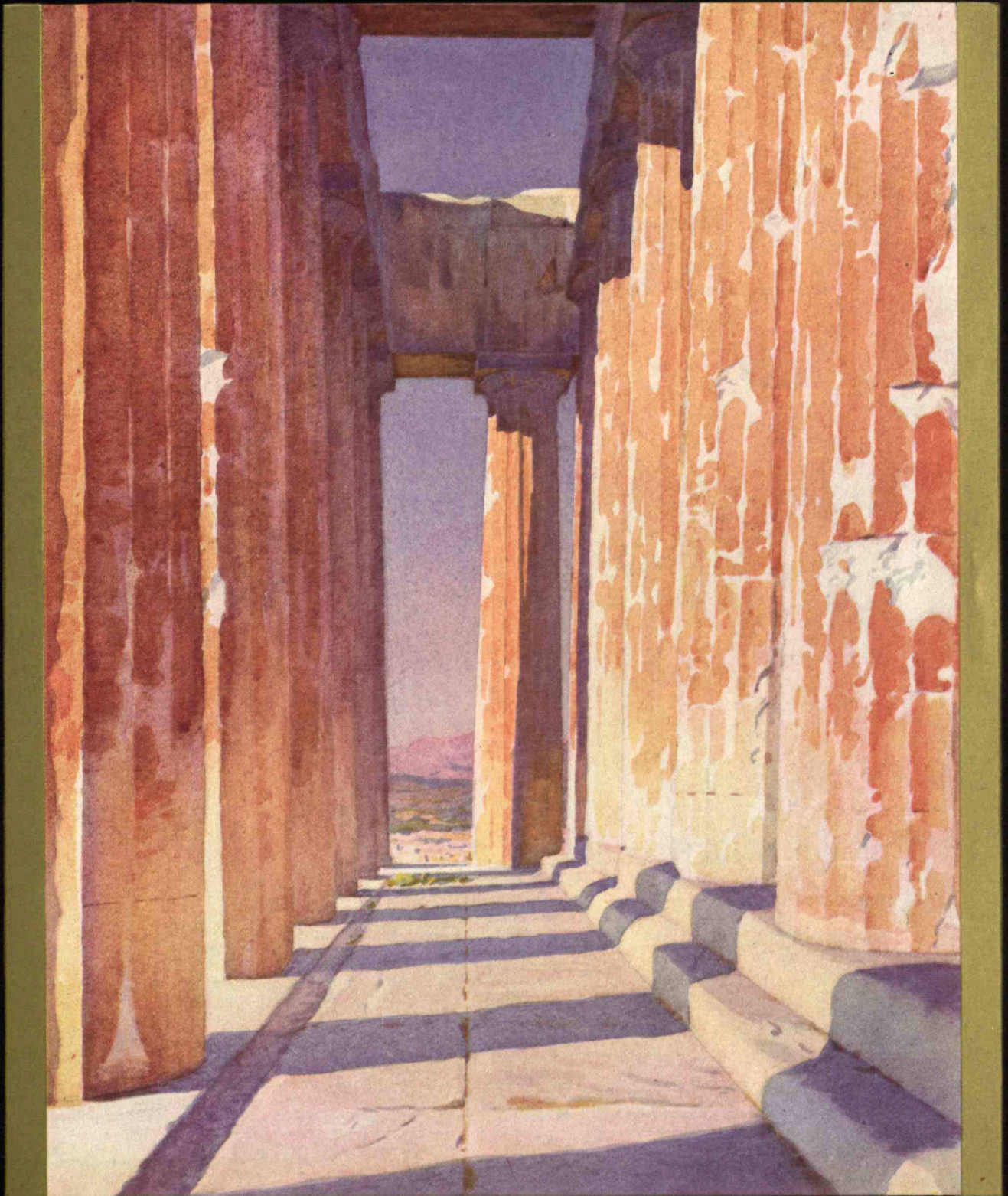


THE TECHNOLOGY REVIEW

MAY 1931



technology review

Published by MIT

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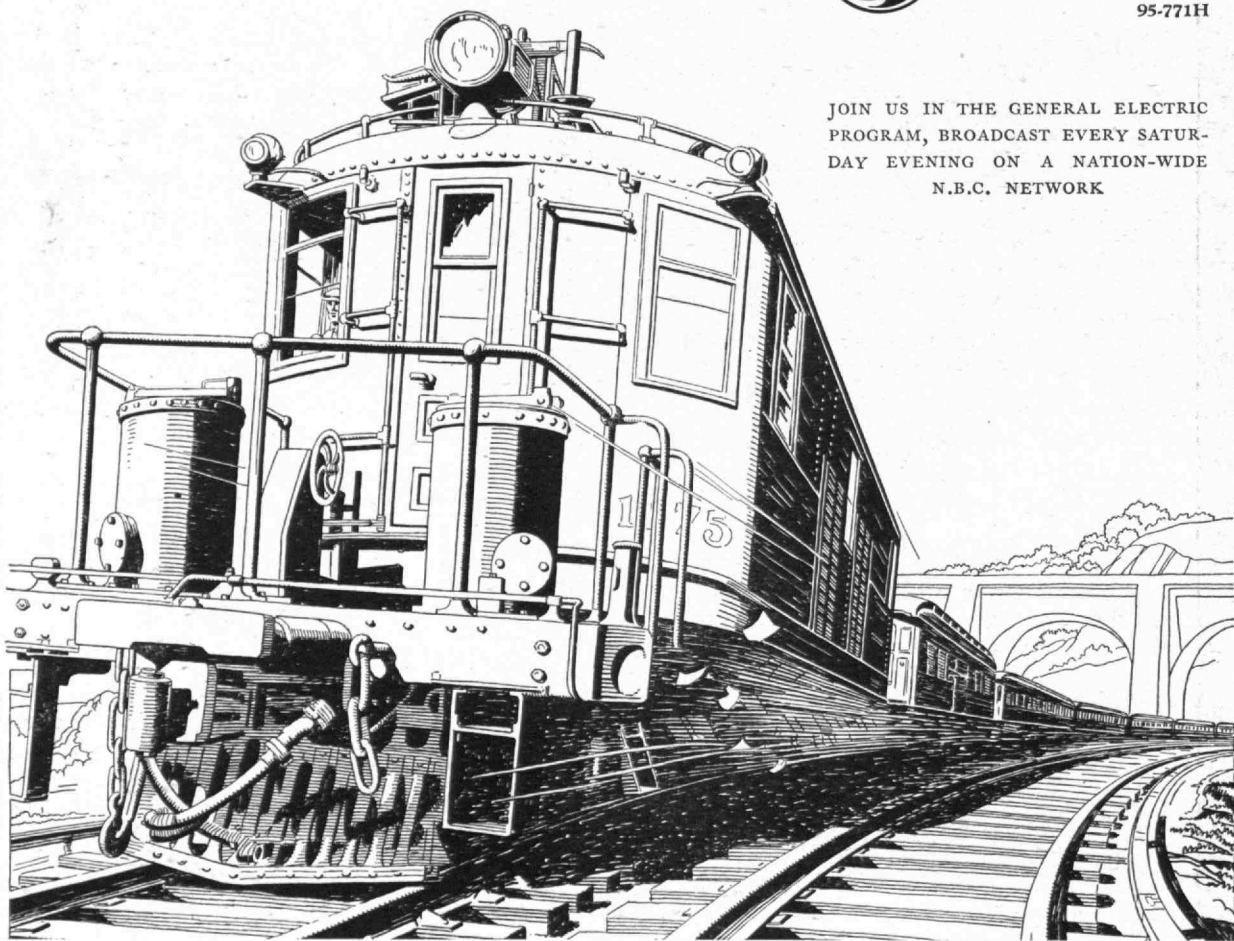
Out of college, established in your profession, it may be *your* job to direct a part of this onward march of electrification.

General Electric has equipped more railroad right-of-way and electrified more lines than any other company. For the future, General Electric anticipates a continuation of the vision, skill, and progress which have thus far marked its contribution to industry and transportation.

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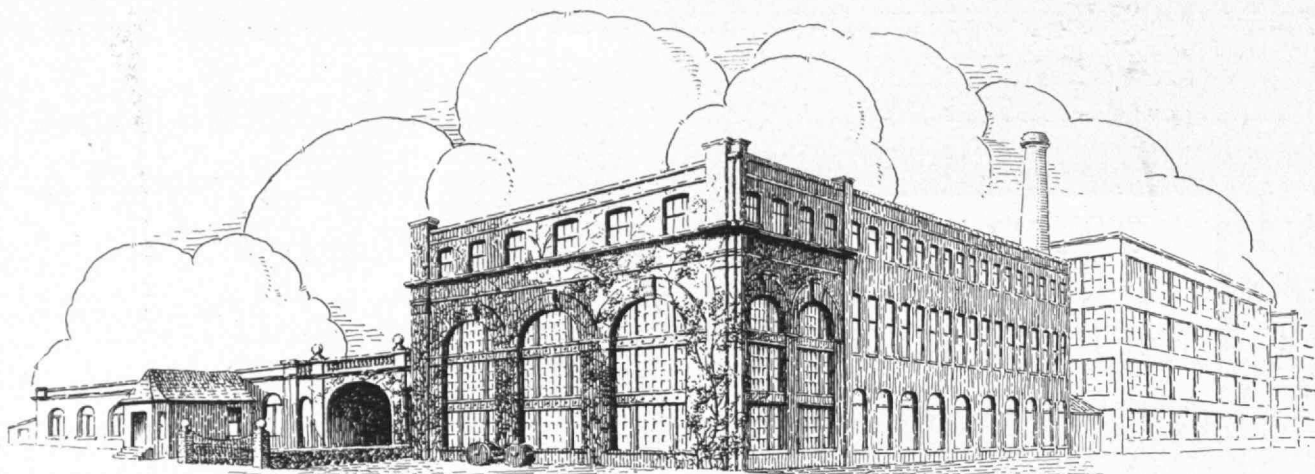
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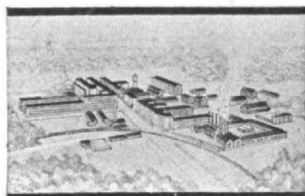


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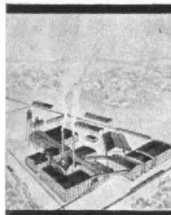
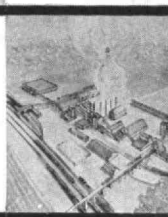
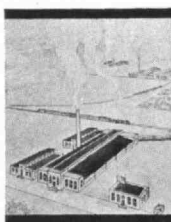
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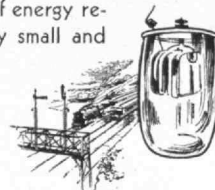
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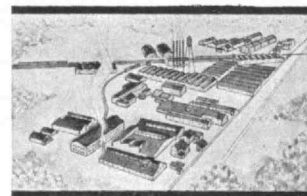
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THE TABULAR VIEW

APPLIED geophysics — what is it? Few laymen are aware of the development and uses of this new applied science and of its importance in the world's economy. Prospecting is, of course, one of the chief functions of the mining and petroleum engineer. As the more apparent locations of oil and minerals in the earth's surface have already been found, it has been necessary for the mining engineer to refine his prospecting methods and to substitute for an age-old technique improved means of discovery. The traditional divining rod, satisfactory to the superstition and credulity of an earlier age, has been supplanted by the applications of instruments developed by science. "Magnetic needles, delicately adjusted, point to iron; the electric plummet discloses the presence of other metalliferous ores, and the seismograph and torsion balance become indispensable aids in revealing the location of new oil pools." Applied geophysics, then, may be defined as the application of physical science to the study of the earth's structure in a commercial way. ¶ Because applied geophysics, or physical prospecting, is to most people merely a phrase and nothing more, The Review is happy that it can present such a lucid exposition of its methods and procedures as that prepared by Mr. ROLAND F. BEERS and presented on page 375. Mr. Beers has had a great variety of experience in making geophysical surveys for oil companies in Texas and Oklahoma. After receiving a degree in Electrical Engineering from Rensselaer Polytechnic in 1921, and while employed in the Raytheon Laboratories in Cambridge, he took part-time courses at the Institute in Course VI-C, finally obtaining his master's degree in 1928. After leaving the Institute, he went to the Southwest as a Party Chief with the Geophysical Research Corporation.

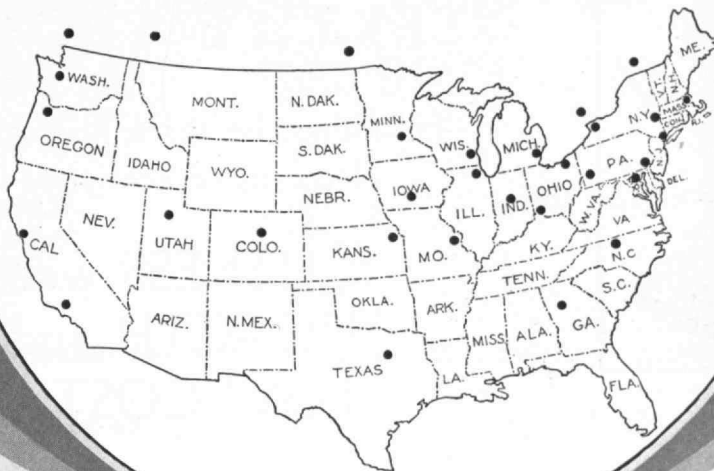
MR. LOBDELL, publisher of The Review, it will be recalled, was the author of a comparative study of American and European train speeds published in the February Review. His article on locomotives in this issue is the first of a series of two.

THE history of chemistry has long been one of the chief interests of Professor TENNEY L. DAVIS, Contributing Editor to The Review. "The Pill of Immortality," which he contributed for this month, deals with the early history of alchemy and was written with LU-CHIANG WU. Mr. Wu, of the class of 1928, now doing graduate work at the Institute, translated the passages from one of the Taoist Classics purporting to be a commentary on the Book of Change. It is in reality, however, a treatise on the preparation of the pill of immortality. ¶ After his graduation from Technology in 1913, Professor Davis continued his studies at Harvard where he received his master's and doctor's degree. In 1919 he joined the Institute's Instructing Staff, and since 1926 he has been an Associate Professor of Organic Chemistry. His keen interest in the history of chemistry opened the way to his election as Secretary for the Division of the History of Chemistry of the American Chemical Society in 1927. He

(Continued on page 368)

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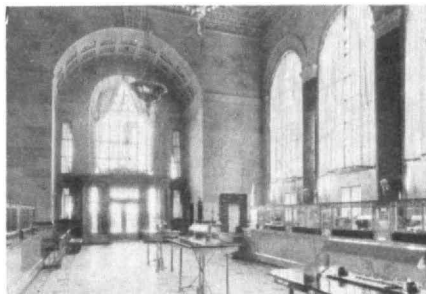
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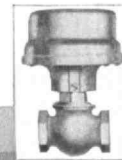
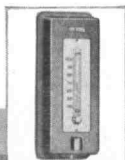


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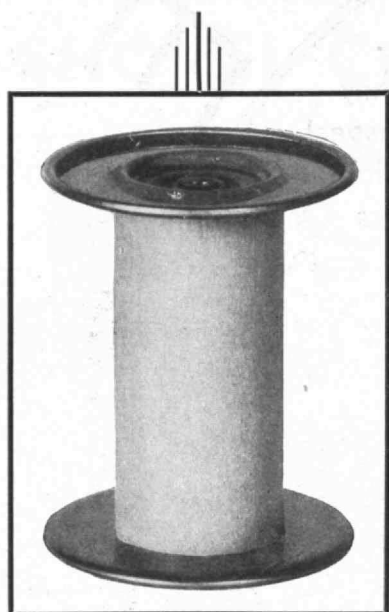
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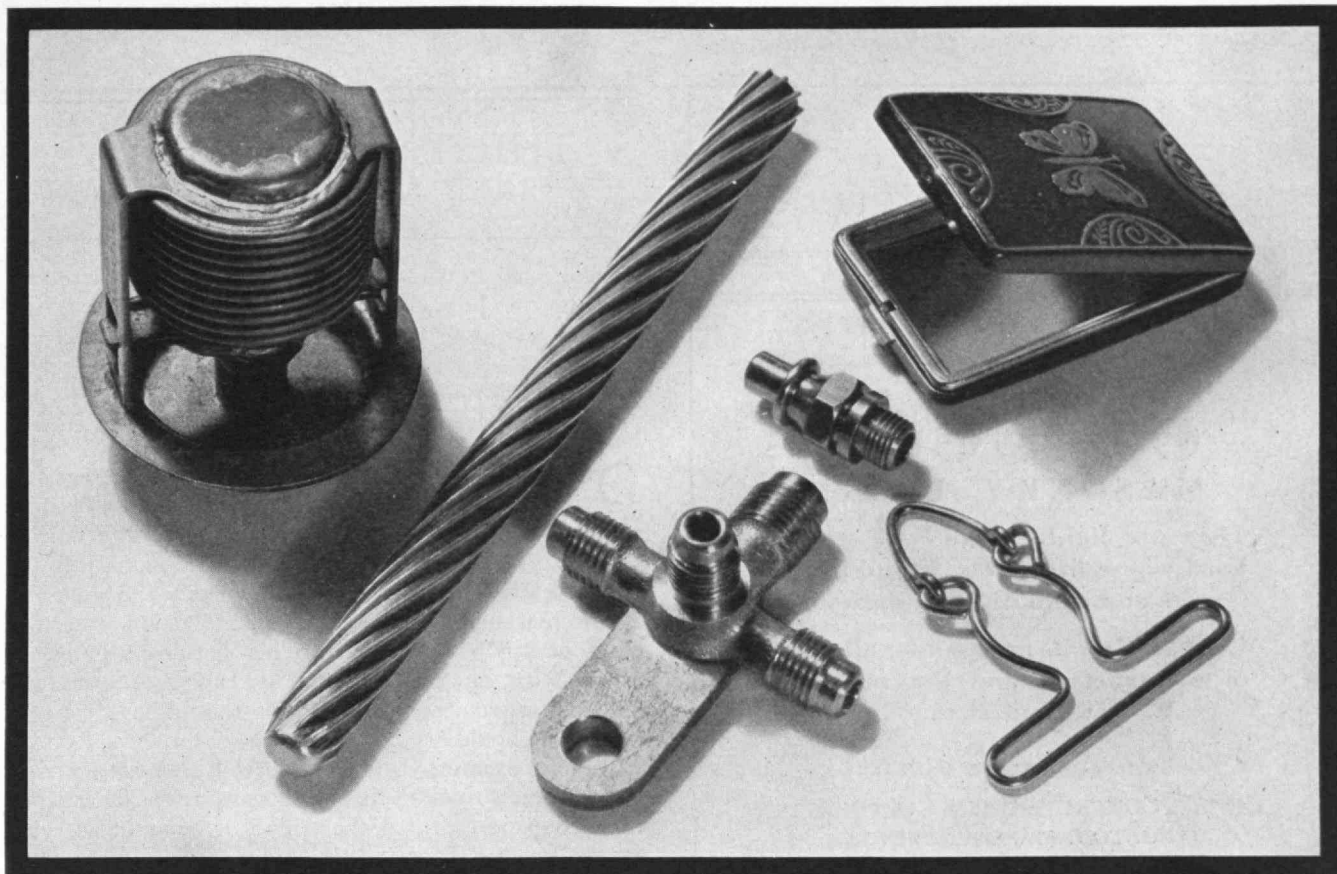
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Such work involves a chain of specialized abilities which have been steadily developed by Scovill during a period of more than a century.

Design . . . Scovill has co-operated in the design of many of the metal parts and products which are used in every home, every office, every industry — from radio condensers to street-car tokens, lawn-sprinklers to lipstick holders. . . . Many an invention in many an industry has been translated into practical production terms by Scovill designers.

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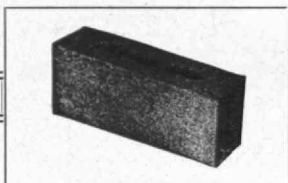
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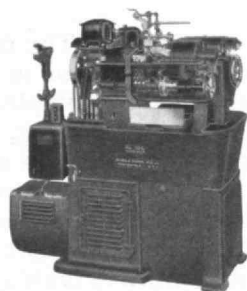
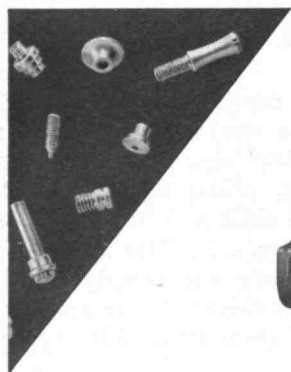
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THE TABULAR VIEW

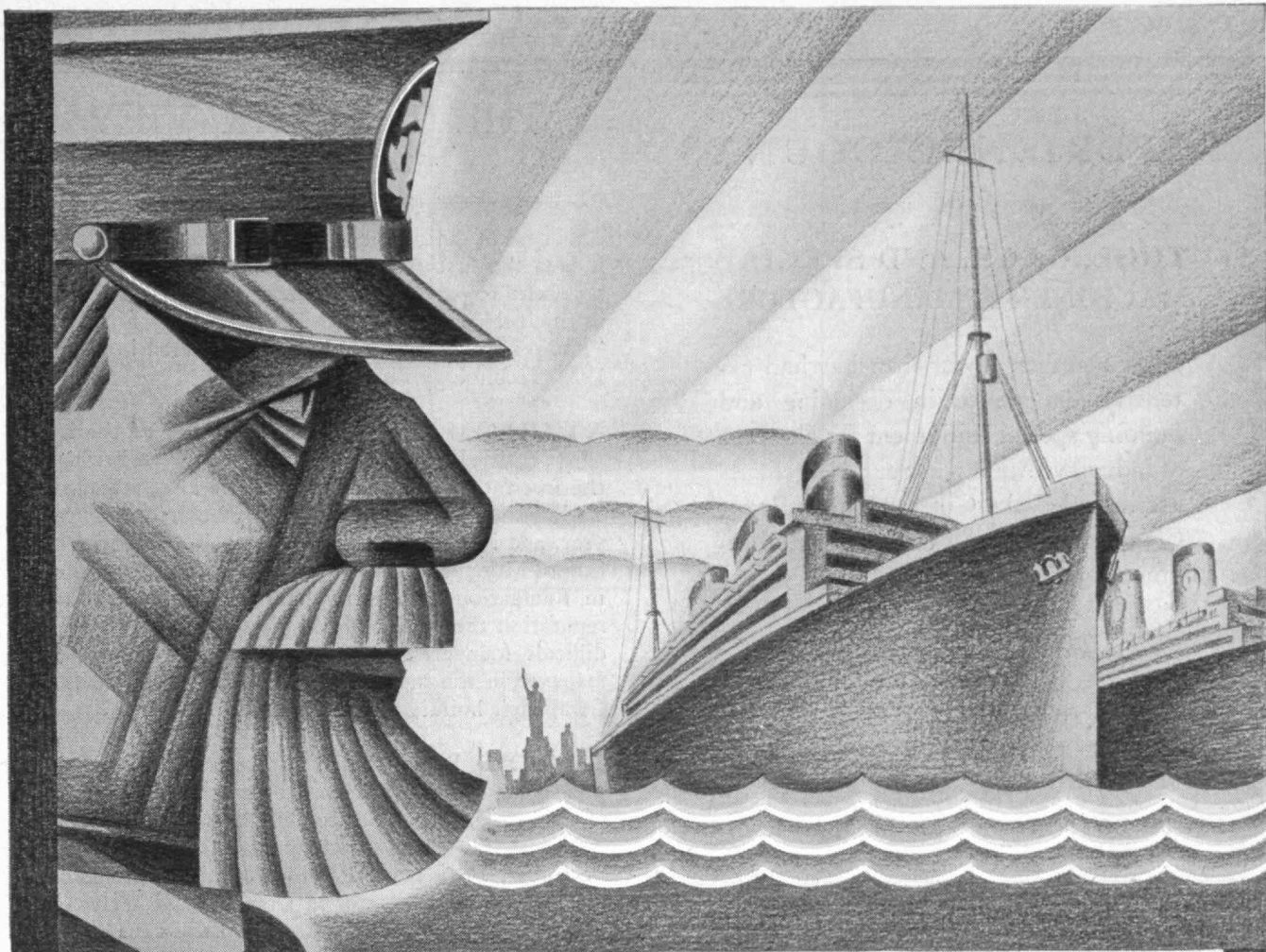
(Continued from page 364)

has collected an unusual library on this his favorite subject. In the July, 1929, Review Professor Davis contributed an article on the beginnings of authentic science.

Perhaps like every human woe
It springeth from the radio.

DELICATE geophysical instruments are not required to detect in the upper strata of the American people a growing displeasure with radio broadcasting in this country. The persistent, distasteful, indiscriminating, advertising jargon that fills such a large part of the programs is the chief source of discontent. Radio broadcasting, the child of big business, is also big business's ballyhoo artist. What can be done about it? Such an enormously valuable instrument of civilization should never be corrupted; it should not even be misused. Professor ROBERT E. ROGERS examines this problem in his article on page 386. He points to radio's tendency to usurp the function of the newspapers and to the failure of our scheme, supported by advertising, to give radio entertainment compatible with normal, human intelligence. After a particularly thorough pathological consideration of American radio he concludes with some suggestions for mitigating the present undesirable conditions. ¶ A correspondent of the *New York Times* in a letter to that newspaper last month made some suggestions that in many ways supplement Professor Rogers' remarks. His first suggestion for reform is the necessity for conducting broadcasting as a public service without any form of commercial motive. The second point concerns the central, unified control of radio service, free from the all-pervading spirit of competition. Third, the service should be established under the auspices of the State but not conducted by the State. Fourth, there should be adequate financing through a licensing system or in some way that does not put the public at the mercy of the advertisers. "The ether should not be put at the power of money." ¶ Several things become plain from the trend of these criticisms: that the public doesn't know its own mind; that it is susceptible to good influences as well as to the mediocre or unworthy; and that the solution of the middle-class taste problem does not necessarily mean a general lowering of standards to the "level of 13-year olds," but may lie in the furnishing of genuine entertainment, which after all has a fundamentally universal appeal when allied to art. ¶ Professor Rogers was graduated from Harvard in 1908 and received his master's degree in 1909. He has been a teacher in the English Department at the Institute since 1913, serving as Editor of *The Review* from 1917 to 1922, the only non-Technology man to hold that position. For a number of years he has been connected with the Massachusetts Division of University Extension and it was under their auspices that he broadcasted a course in American literature in 1924, one of the earliest experiments in education by radio.

(Continued on page 370)



MARINE

The captain commands. Thousands of mechanical devices stir into action, smoothly, quietly . . . the great ocean liner—a city in itself.

Behind countless devices in the assembly of this marvel of oceanic transportation—precision . . . mechanical perfection—the grinding machine and the grinding wheel have been busy.

Modern transports of the sea, toward whose marvelous efficiency the abrasive industry contributes, reciprocate by carrying finished abrasive products of Norton Company, Worcester, Massachusetts, to the ports of the seven seas.

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THE TABULAR VIEW

(Concluded from page 368)

This type of radio education was a unique experiment as it was the first time that listeners were given an opportunity to pay for their entertainment. His experiences in this field were described in an article by him entitled "Radio's Coming of Age" which appeared in the May, 1925, Technology Review.

WILLIAM H. MUESER, the author of the article entitled "11,000 Tons on Wheels," is a graduate of the Institute in the class of 1922. He later attended the Technische Hochschule Zu Berlin, Germany, for over a year, and in the fall of 1923 became associated with the firm of Moran and Proctor. This firm specializes entirely in foundation engineering and has to its credit and reputation the successful completion of many large and difficult foundation projects. Mr. Mueser was project manager in the moving of the Indiana Bell Telephone Company's building described in his article.

HAROLD B. WARREN is the artist whose water color of the Parthenon is reproduced on the cover of this issue. He also executed the water color of the cathedral at Chartres which appeared on the cover of the December, 1930, issue. Previous to his retirement, Mr. Warren was an instructor in Drawing and Water Color in the Schools of Architecture and Landscape Architecture at Harvard University.

IN THESE columns last month we quoted a delightful bit of verse about the adrenal glands and heroism. Since then another startling announcement has inspired the following piece by L. H. ROBBINS in the New York Times:

A MANGANESE LULLABY

Mother love, a Johns Hopkins scientist finds, is due to a trace of manganese in the mother's food, and may disappear when the element is eliminated from her diet.

Close your eyes, my baby,
Sleep, my precious dear.
Mother's ways have, maybe,
Seemed a bit austere,
But now, at last, she means to cease
From knocking you about.
Mamma's taking manganese
To bring her fondness out.

Is mother acting funny
To cuddle you like this?
Never fear, my honey,
Nothing is amiss.
Close your baby eyes in peace
And smooth your infant brow.
Mammy's adding manganese
To her diet now.

FOR those readers of The Review who are not familiar with its publication schedule, we call attention to the fact that no issue appears dated June. The next and last issue of this volume will be that dated July, which will be in the mails on June 27.

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THE TECHNOLOGY REVIEW

Edited at the Massachusetts Institute of Technology

A NATIONAL JOURNAL DEVOTED TO SCIENCE, ENGINEERING, AND THE PRACTICAL ARTS

VOLUME XXXIII

NUMBER 8

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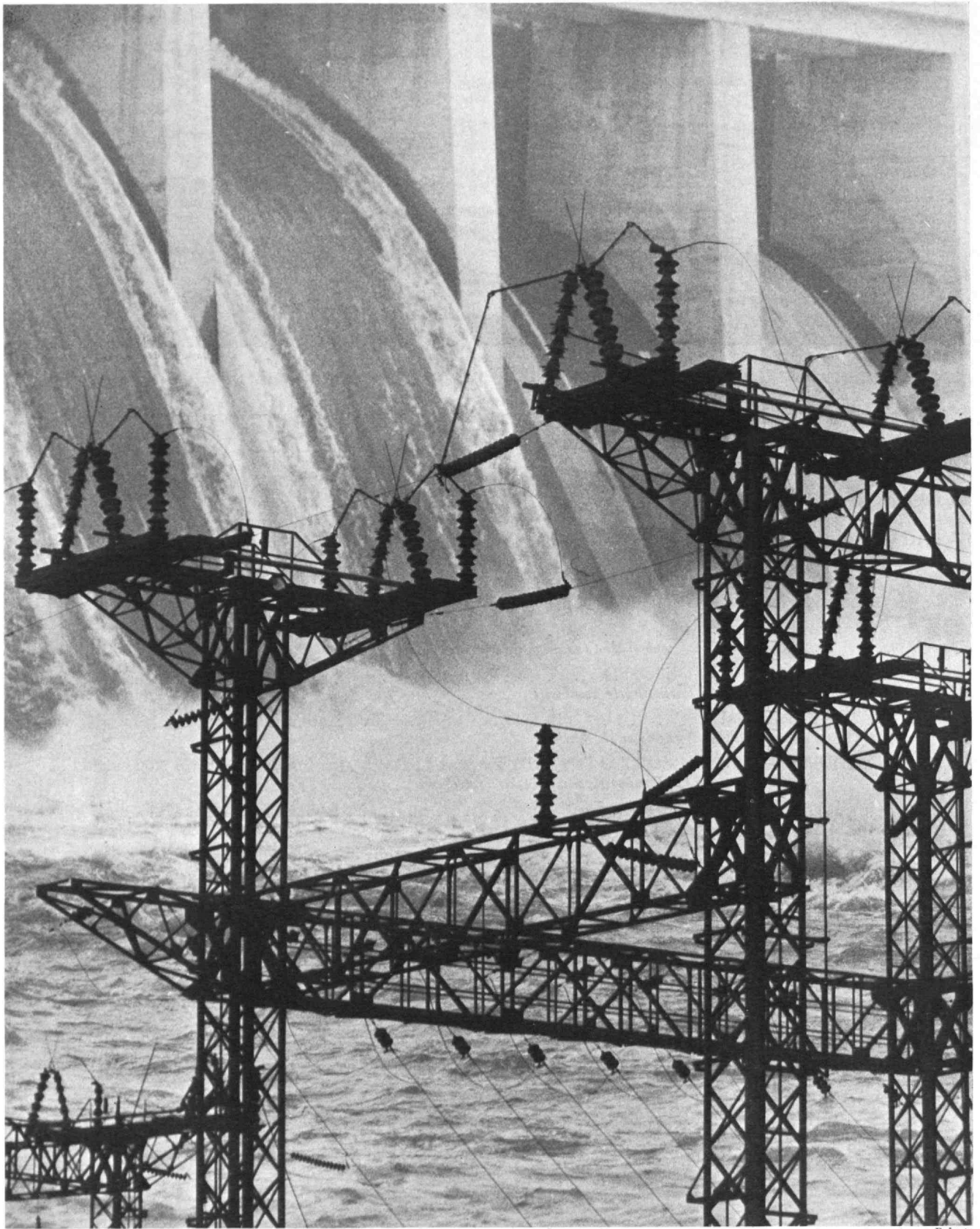
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Roberts

POWER

A COMPOSITE PHOTOGRAPH OF THE CONOWINGO HYDROELECTRIC PROJECT

THE TECHNOLOGY REVIEW

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DOODLE-BUGS DEPOSED

Geophysical Prospecting in the Southwest

BY ROLAND F. BEERS

See Page 364

TWO men were riding over a county highway near Seminole, Okla. The car was traveling about 20 miles an hour; the driver was watching his companion very closely. He would bear watching, too, if you could have seen him. His eyes were tightly blindfolded, and between his thumbs he held a forked branch from a peach tree. Bending over the peach branch, he was almost holding his breath, as if he expected something to happen.

As the car approached a group of oil wells near the road, the driver watched the peach branch more intently, but without changing the speed of his car. Soon they passed the wells, and as they did, the forked stick snapped up against the man's breast, then fell back again into a horizontal position. The car kept on, and at times the stick repeated this performance, although no oil wells were in sight. The driver made a careful note of the places where this curious effect occurred.

The driver of the car represented a small royalty company; his queer-acting companion was a famed "divining rod" operator. Two years ago this "wizard" had stood on a hill in Pottawatomie County and pointed out the site of the present Asher pool. The number of his successes was large; how many failures, no one knows. It is hard to explain a

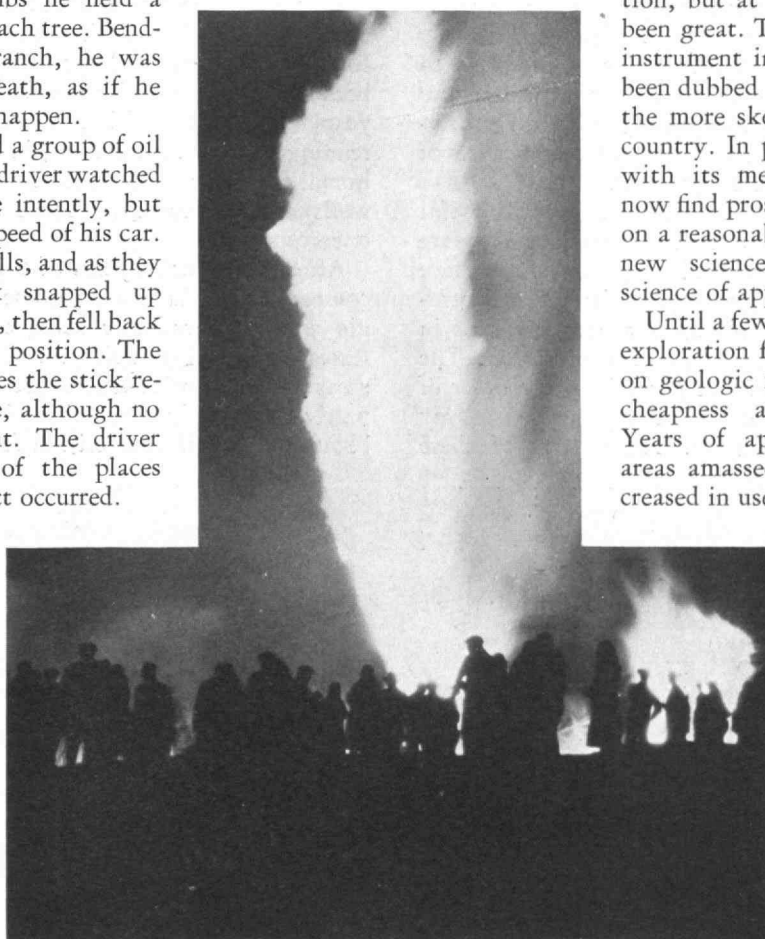
performance like this, but for every case of its kind there are scores of complete failures. "Doodle-bugs," they are called.

Men engaged in the serious business of locating oil for actual production give the doodle-bugs little consideration, but at times their influence has been great. There is not a geophysical instrument in use today that has not been dubbed "doodle-bug" by some of the more skeptical natives of the oil country. In place of the divining rod with its mediæval superstition, we now find prospecting for oil conducted on a reasonable and scientific basis. A new science has been born — the science of applied geophysics.

Until a few years ago, practically all exploration for oil was based entirely on geologic methods because of their cheapness and widespread utility. Years of application in productive areas amassed files of data which increased in usefulness and value as they accumulated in detail.

Their success is based on the theory that oil-bearing structures show their presence by similar features on or near the surface of the ground. A map of surface structures thus supplies the lead for further prospecting or drilling.

In the oil-bearing regions of the Southwest, the deposits are found on or near sub-surface anticlines or "highs." Buried



Roland F. Beers

"WILD ABE" AFIRE, NEAR WEWOKA, OKLA. THE HUGE GAS WELL CAUGHT FIRE WHEN ATTEMPTS WERE MADE TO "SHOOT IN" THE WELL BY T.N.T. FINALLY EXTINGUISHED BY NITRO-GLYCERINE AFTER HAVING BURNED SEVERAL DAYS



Helen C. Beers

A RECORDING TRUCK; REFLECTION SEISMOGRAPH. REFLECTION SEISMOGRAPHS EMPLOY MULTIPLE DETECTORS

mountain ranges, ridges, or domes are likely spots for the accumulation of oil. The reasons for this manner of accumulation are frequently technical and detailed, but, in a broad sense, oil migrates to these regions because of its lesser density compared with that of water. The leveling force of gravity, the force of capillary attraction, gas pressure — all these factors combine to force oil to local and regional highs.

The origin of the highs is usually somewhat complicated. Earthquakes, stresses in the earth's crust over long periods of time, isostasy (the tendency of the crust to maintain pressure equilibrium) are some of the factors which cause folds and wrinkles in the originally horizontal strata. Erosion and deposition are secondary causes of the complexity of subsurface structures.

Today, geologic methods are the most generally useful and widespread for reconnaissance exploration. They are particularly good in undeveloped virgin areas. A surface geological party, consisting of a geologist and an instrument man, can map outcroppings at a very low cost in comparison with other methods of exploration. The monthly cost of a good surface party is of the order of several hundred dollars, and such a party can survey about 20,000 acres per month. The success of these methods is shown by the fact that probably 90% of the oil fields lie on surface-shown structures, but very few of such structures are productive. So long as land is cheap and the price of oil warrants the risk of drilling dry holes, these methods are economically satisfactory. The greater part of oil field development has followed

along these lines. Until overproduction of oil depressed the industry a few years ago, no great demand existed for improvements in exploration methods.

The development of most oil fields in the Southwest is largely a story of excessive and extravagant well drilling and "wild-catting." Anyone who had the courage and initiative could collect options on a block of acreage in a promising area for a very small cash deposit. These options would be placed in a bank for security and the promoter would then approach oil companies for drilling operations. He would exhibit his surface maps, if there were any, often would produce a doodle-bug expert, and suggest that he was willing to let the company in on his projected well. His price for acreage was generally such that it paid the company to buy a share of his holdings in order to safeguard their own position.

If the promoter succeeded in getting enough contributors to his well, he bought up the options and proceeded with the drilling.

Generally he retained enough acreage or royalty to insure him a large profit in case oil was found. If the wild cat proved to be a dry hole, the promoter at least broke even. If too few partners could be found to finance the deal, the options were passed by and the project was abandoned.

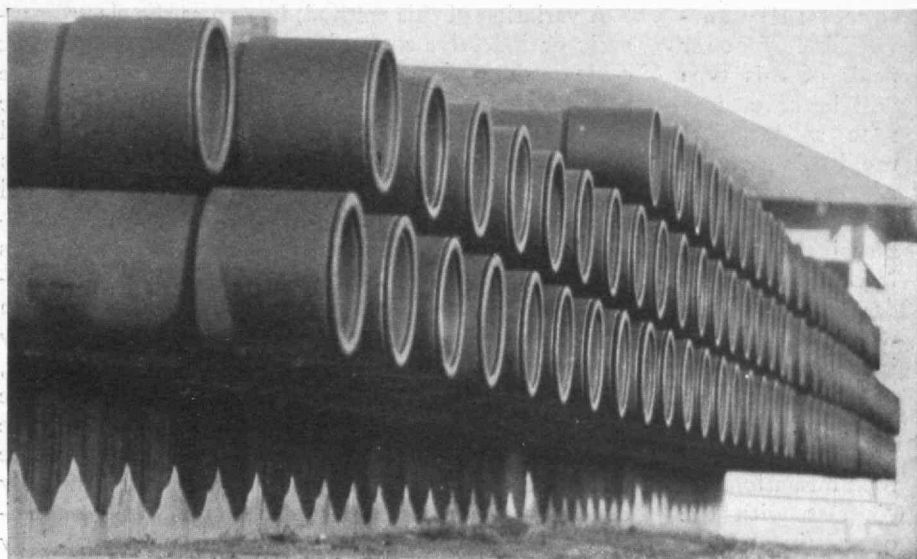
This condition has undoubtedly contributed more to the overproduction of oil than any other single factor. Excessive drilling by large companies has been curbed because of the tremendous fields already opened in recent years and because of improvements in production and refining methods. At present, in one large field in Oklahoma, for every well drilled by major companies, three wells are put down by small scale and irresponsible operators.

After a number of years of this manner of operation, competition for land has become somewhat keener. Virgin areas are gradually being exhausted and prices of leases are climbing rapidly. Today there are unexplored areas where the price of acreage does not warrant drilling, partly because of the prevailing low price of oil, but also because of actual competition for land. For the greater



Stanley W. Wilcox

RECORDING TRUCKS OF A REFRACTION SEISMOGRAPH PARTY ENCOUNTERING FIELD DIFFICULTIES. FROM FOUR TO EIGHT MULES ARE OFTEN REQUIRED TO HAUL THESE LIGHT TRUCKS OVER THE SAND. DUNES FROM 60 TO 100 FEET HIGH ARE COMMON IN THIS AREA — NEAR MONAHANS, TEXAS



A LOADING RACK: PILE OF 8-INCH WELL CASING READY TO BE USED

Roland F. Beers

part, it is no longer possible for the small promoter to exploit a well in the old manner. Even if an operator should succeed in obtaining production in this fashion, he would have difficulty in disposing of his oil, unless he had connections with local refiners and distributors. Most of the large pipe lines are controlled by major companies, which are already overstocked with oil and unable to take the desultory production coming from these unexpected sources. The recent action of the Prairie Pipe Line Company in cutting off its small feeders in Oklahoma and Kansas illustrates the tendencies confronting the small producer today.

WITH a gradual transfer of control in the industry to the hands of the larger companies, there arises a demand for improvement in all operations. It is imperative that the industry maintain its methods of operation on scientific and economic bases. We have already seen the power of scientific procedure in refining methods. The cracking process increased gasoline production from 20% to 40%. The Bergius hydrogenation process further increased the yield to 98%. The unit plan of oil field development is a scientific method of obtaining maximum yield from a new oil pool. Similar details of refinement are in progress throughout most of the major producing companies. By such revisions as these the industry is gradually climbing to a position of economic security. It is not unnatural, therefore, that scientific methods of oil location should meet with the wide acceptance of petroleum executives, even in a time of unwonted depression.

By means of reliable geophysical methods, leasing activities can be confined to areas showing good possibilities of production. Old leases can be explored, and, if found to be non-productive, they can

be turned loose. The annual rental of a dollar an acre will pay for many months of geophysical work by a major company. Old oil pools can be surveyed by geophysical means which will determine their edge and reduce the number of dry holes that are being drilled in these pools. New areas will be explored; pools will be located and allowed to remain undrilled until economic demand warrants their production. In cases where several companies have holdings in a geophysically located field, information may be exchanged, a community pool formed, and scientific methods of production may be employed. At present, whenever one well brings in

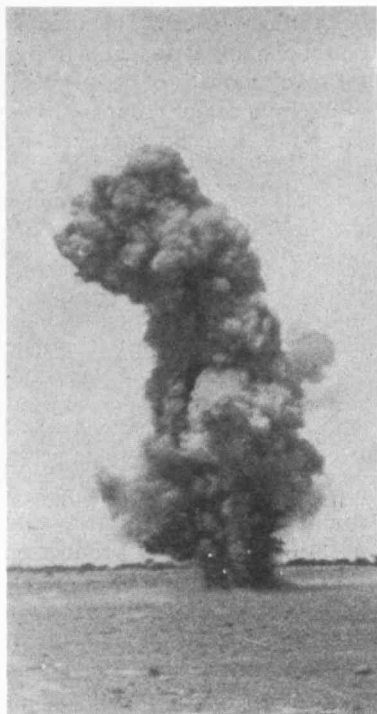
production, all lease holders offsetting it must also drill, by terms of the lease contract, unless the community plan is in effect. By geophysical means, reserves for the distant future may be acquired and if no drilling in their vicinity jeopardizes their security, the oil may be left stored in the ground at the cheapest storage the world provides.

One additional feature has contributed greatly to the growth of applied geophysics. There are certain areas in oil-producing regions where no geologic data are available. In these areas development by wild-cattling is gradually giving way to the use of geophysics. The great Permian basin of West Texas, western Oklahoma and Kansas, is a good example of this type of exploration. The alluvial plains of northern Venezuela offer similar possibilities. Already parts of West Texas have been



Ben S. Melton

TAKING FIELD MEASUREMENTS IN THE ELECTROMAGNETIC METHOD OF OIL PROSPECTING. THE OBSERVER IS IN COMMUNICATION WITH THE SENDING STATION BY RADIO. THE TWO HELPERS ARE HOLDING THE RADIO ANTENNA ABOVE THE GROUND DURING THE PERIOD OF COMMUNICATION. THE INDUCTIVE LOOP MOUNTED ON THE TRIPOD IS USED TO MEASURE HORIZONTAL AND VERTICAL COMPONENTS OF THE ELECTROMAGNETIC FIELD, AS WELL AS THE PHASE ANGLE. A VACUUM TUBE AMPLIFIER AND IMPEDANCE BRIDGE ARE SHOWN IN THE PICTURE



Helen C. Beers

T.N.T. SHOT TAKEN JUST AFTER THE
FIRE OF THE CHARGE

successfully surveyed and other fields of this type will be covered as soon as technical methods can be adapted to them.

Of all the geophysical methods in common use today, there are four which have some importance. Each one is based on some property of the subsurface rock formations, in contrast with the over-lying rocks. None of the methods measure any common quantity, hence correlation of surveys by different methods is often difficult. The four principal systems are called the

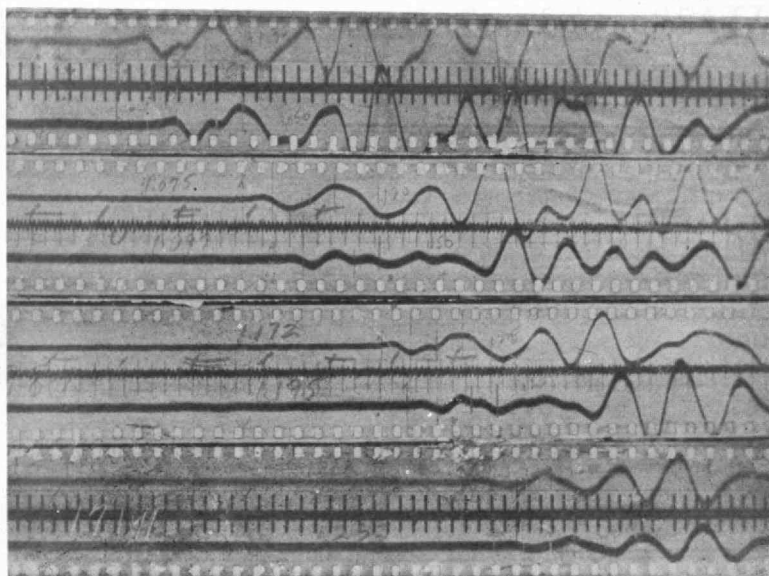
electric, magnetometric, gravimetric, and seismic. None of the methods operate on the properties of oil, with the possible exception of the electric method. They are usually concerned with some rock formation more or less closely associated with oil-bearing strata. The determination of a satisfactory structure is not the sole criterion for the location of oil. Geophysical surveys are generally interpreted by the cooperation of a geologist and a geophysicist, who are able to determine whether the other essential conditions are present, such as porosity, opportunity for accumulation, and presence of oil-producing agencies.

The electric method is based upon the relative conductivities of those horizons conformable with production and of the other layers in the geologic section. There are in general two methods of field procedure. The electric method is accomplished by establishing an electric field between two surface earth electrodes a mile or more apart, and making potential measurements of this field at close intervals. If the earth materials are everywhere uniform in composition and occurrence, no anomalies of potential distribution are found. Layers of conducting material, such as salt water bearing sediments, are employed as key horizons, upon which indications of geologic structure may be observed. By mapping the equipotential lines found at the surface, changes in subsurface formations are determined. Either alternating or direct current may be used; but direct current offers the only possibility of penetrating below highly conducting layers.

A variation of this method, known as the electromagnetic or inductive method, employs a loop of electric cable on the surface carrying an alternating current. The field of this current induces a secondary field in the ground layers. By measurement of the horizontal and vertical components of the superimposed fields, as well as the phase angle, indications of conducting layers and their positions are determined. Because of the complicated mathematical theory required for the rigorous interpretation of field measurements, the number of successful applications of the electric methods has not been great. Their use has been largely confined to shallow structures and to abrupt changes in subsurface formations, such as faults and shallow salt domes. At present the usefulness of the instruments lies in a maximum range from 1,000 to 2,500 feet. The methods offer considerable attractiveness because of the possibility of ultimately extending their use to measurements on oil bodies themselves. Here their usefulness would be unsurpassed by other means.

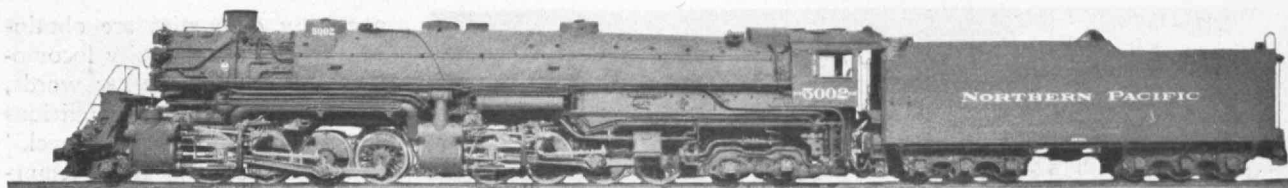
The magnetometric method functions by virtue of the differences in magnetic susceptibility of rocks. The earth's magnetic field is assumed to be regionally constant at any given time. Anomalies are caused by the occurrence of local magnetic materials. There are many forms of the magnetometer, ranging in style from the dipping needle to the more recent Super-Dip by Hotchkiss and the micro-magnetometer by Rieber. Variations in the magnetic field by the action of sedimentary rocks are extremely small. The accuracy of their measurement is limited by the great masking effect of the general field of the earth. In practice, it is customary to neutralize the general field of the earth, leaving the anomalies exposed for observation.

(Continued on page 406)



Roland F. Beers

A REFRACTION SEISMOGRAPH RECORD. IN REFRACTION WORK, THE "FIRST BREAK," OR EARLIEST ARRIVAL OF WAVES FROM THE EXPLOSION, IS THE BASIS OF THE PROCEDURE. THESE "BREAKS" CAN BE SEEN INDICATED BY PENCILLED ARROWS ON THE ORIGINAL RECORDS. FROM THE TIME OF THESE POINTS, THE DEPTH OF THE REFRACTING HORIZONS CAN BE COMPUTED. VELOCITY OF THE OVERLYING BEDS ARE DETERMINED BY SHOOTING ACROSS A WELL, WHOSE DATUM VALUES ARE WELL ESTABLISHED. THE WAVES ARRIVING AFTER THE FIRST BREAK ARE TOO COMPLICATED TO INTERPRET WITH RELIABILITY, BUT OFTEN SERVE AS GUIDES IN ESTABLISHING THE FIRST BREAK. THE TIME BETWEEN THE SHORT VERTICAL LINES IS .01 SECONDS



Baldwin Locomotive Works

BALDWIN SINGLE EXPANSION (2-8-8-4 TYPE) ARTICULATED LOCOMOTIVE. BUILT APRIL, 1930

STEAMING UP

Steam's Bid for Posterity on the Rails

BY HAROLD E. LOBDELL

See page 364

THROUGHOUT American railroading's first hundred years, steam has remained the dominant form of motive power. The story began in August, 1829, when the *Stourbridge Lion*, brought from England by the Delaware and Hudson Canal Company, made a successful 17-mile trip on wooden rails. It continued throughout the nascent 1840's when the Harlem Railroad was complimented in the public prints for introducing cars "so high that one can stand erect when he cannot find a seat;" the pioneering 1850's and 1860's which saw the continent spanned, the advent of Pullman sleepers, primitive diners and Sir Henry Bessemer's means for making steel rails a practicability; and the 1870's with their extended use of air brakes. During all this time and the expansion period of the burgeoning decade of the 1880's in which nearly 70,000 miles of new tracks were laid down, steam's commanding position remained unchallenged.

Midsummer of 1895 brought the initial threat of competition. In June of that year, the Nantasket Branch of the New York, New Haven and Hartford, hitherto a steam road, began electrical operation; in August, steam was banished from the Baltimore tunnels of the B. & O. With the turn of the century, a bad accident in the Park Avenue tunnels of the New York Central, to the seriousness of which low visibility due to steam and gases contributed, focused public interest on the manifest benefits of abating smoke, fumes, noise and fire hazard from tunnels and terminals.

There followed an enactment of the New York Legislature requiring that, after July, 1908, electric motive power be used in the City of New York. With this edict the New York Central complied so promptly that its entry into the city was electrified by 1906. Meanwhile, the Long Island Railroad electrified much of its suburban service. Subsequent electrifications in and about the New York area, with the approximate dates of their completion include: the New Haven to Stam-

ford, 1907, and to New Haven, 1914; the entry of the Pennsylvania to Manhattan, 1910; the connecting railroad over the Hell Gate Bridge, 1918; and, most recently, the Lackawanna's suburban service, 1930.

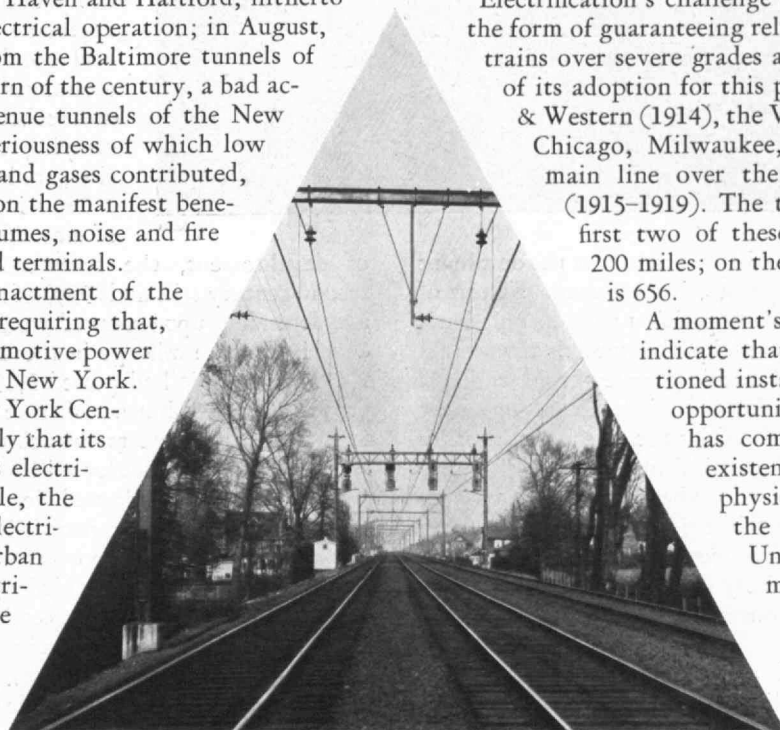
Steam's ultimate passing from congested urban areas now seems assured. Urban electrification improves the values of adjacent property and permits the use of "air rights" over trackage for hotels, office buildings and other structures. Philadelphia in 1915-1918, Chicago in 1926 as far as the entry of the Illinois Central is concerned, and Cleveland in 1930, began to benefit from these obvious results of the partial or complete exile of steam.

In tunnels, other than those connected with terminal developments, electrification has again been resorted to with advantage in such instances as the St. Clair between Port Huron, Mich., and Sarnia, Ont., in 1908; the older Cascade of the Great Northern in 1909 and the later tunnel of like name in 1929; the Detroit of the Michigan Central in 1910; the Hoosac of the Boston & Maine in 1911.

Electrification's challenge to steam has also taken the form of guaranteeing reliable operation of heavy trains over severe grades and three chief examples of its adoption for this purpose are: the Norfolk & Western (1914), the Virginian (1926), and the Chicago, Milwaukee, St. Paul and Pacific's main line over the Rockies and Cascades (1915-1919). The trackage on each of the first two of these projects approximates 200 miles; on the last, the route mileage is 656.

A moment's reflection will suffice to indicate that in all the above-mentioned installations electrification's opportunity for contest with steam has come as the result of the existence of "bottlenecks," or physical obstacles impeding the smooth flow of traffic.

Unscrambling tangled train movements by increasing the capacity of trackage, quickly, efficiently, and minus an accompaniment of din and dirt, has been electrification's forte.



A SECTION OF THE D. L. & W. R. R. SUBURBAN ELECTRIFICATION



Roberts

If, however, it is ever to displace steam as the dominant form of railroad motive power, it must meet the test of main-line usage. Here the competition must be on a basis of economics, unadulterated by the special advantages which weigh heavily in terminal zones or in tunnels. Though prompted by gradients on its right-of-way over the mountains, and influenced by the scarcity of near-by coal and the presence of plentiful near-by water power, the St. Paul's electrification must be treated as the pioneer example of main-line electrification over a considerable distance. The well-known economic history of this road, though it may not be entirely chargeable against electrification, can hardly be construed as an argument in its favor.

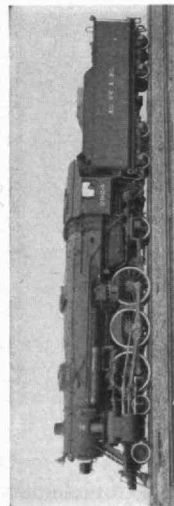
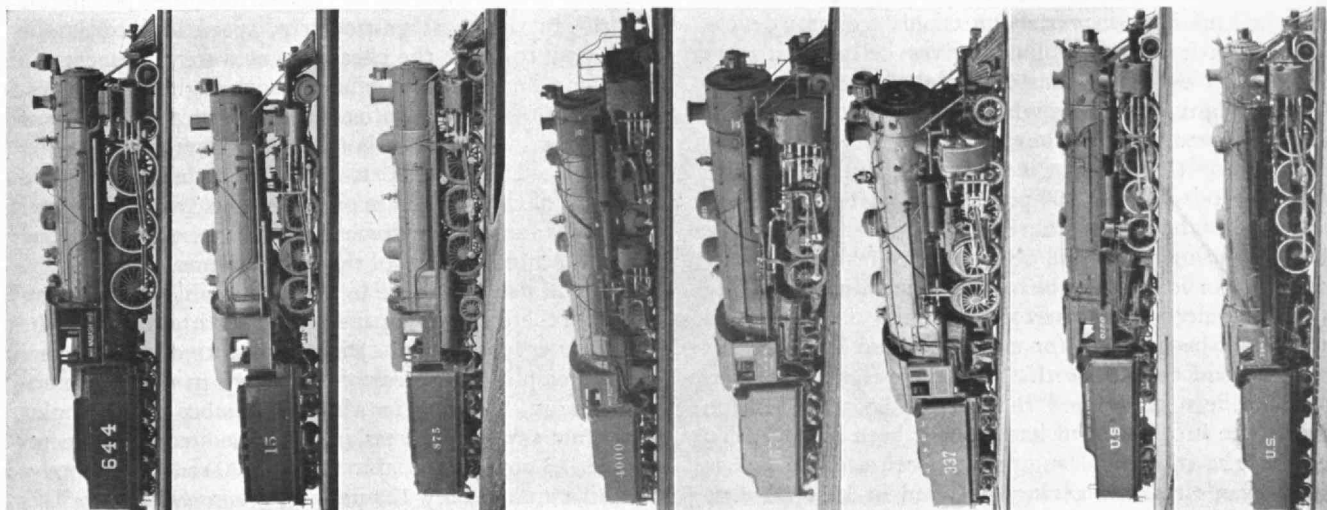
Under certain special conditions, however, where dense and heavy main-line traffic conditions prevail; where increased capacity is vital and the laying of additional trackage is impossible or impractical; where

operating economies are obtainable through large daily locomotive mileages — in other words, where main-line traffic conditions approach a "super-bottleneck" situation — electrification temptingly beckons to harassed operating executives. Such a situation has impelled the present undertaking of the Pennsylvania to electrify between New York and Washington, and on the outcome of this venture, electrification's destiny for main-line usage in the future will be in a large measure predicated.

As Professor Dugald C. Jackson succinctly pointed out in *The Review* over a year ago, "the shortcoming of railroad electrification is the first cost, which is high compared with steam motive power for most situations; and this limits the economic applicability of railroad electrification in America. . . ." When it is considered that the capital expenditure to electrify a steam road is commonly of the order of \$35,000 to \$75,000 per track-mile (excluding motive power and rolling stock) depending upon the location and character of service, and that the initial outlay for an electric locomotive may run twice that for a modern steam engine, the truth of his observation is apparent. Except under very special conditions, the operating economies which electrification must effect to counterbalance heavy carrying charges on its installation, are impossible of attainment.

Thus it is a fact that, with all of electrification's quarter century of development, the commencement of railroading's second century still finds 99% of the country's route mileage dependent upon steam for motive power. In 1920 the electrified route mileage in the United States was about 1,450, by 1929 it had passed 1,850, and it will soon approximate 2,300. But at this rate of growth, even if it be maintained, many years must elapse before any very large proportion of the quarter million miles of the country's railroads will have adopted electric operation.

For years American railroads have been accustomed to buy their steam motive power units at less first cost than other power could be provided and, even as this is detrimental to the case for the electric locomotive, so may it be expected to inhibit the adoption of oil-burning internal combustion locomotives, the cost of which exceeds that of the electric. Much evidence pointing to savings in the operating and maintenance expense must be adduced to mitigate the effect of this higher first cost.



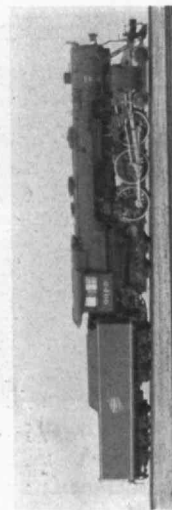
TEN WAYS OF EXPRESSING THE DEVELOPMENT OF THE LOCOMOTIVE BETWEEN 1905 AND 1931*

| | 1905 | 1910-13 | 1918 | 1923-25 | 1931 |
|--|---|---|---|---|---|
| 1. Axle Loads (lbs. per pair of wheels) | 40-45,000 | 50,000 | 55-60,000 | 63,000 | 65-72,000 |
| 2. Steam Pressure (lbs. per sq. in.) | 180-200 | 200 | 200-210 | 210-225 | 250-275 |
| 3. Steam Quality (temperature degrees F.) | 385 saturated | 538 (sup. 150) | 590 (sup. 200) | 650 (sup. 250) | 700 (sup. 300) |
| 4. Stoker, | none | only large articulated engines | heavy road engines | heavy road engines | heavy road engines |
| 5. Feed Water Heater | none | none | experi- mental | about 50% application | all road |
| 6. Combustion Rates (lbs. of coal per hr. per sq. ft. of grate area) | 100-150 | 80-120 | 80-120 | 80-120 | 100 or less |
| 7. Tender Capacity (gallons) | 6-8,000 | 8-9,000 | 10,000 | 15,000 | 18-22,000 |
| 8. Steam Consumption (lbs. per I. H. P. per hr.) | 28 | 21 | 20.5 | 19-20 | 18.5 |
| 9. Typical Tractive Power (lbs.) | 40,000 | 50,000 | 60,000 (2-8-2) | 63,000 (2-8-2) | 70,000 |
| 10. No. of parts in Loco- motive Bed | 250 total, of which 35 were major parts | 250 total, of which 35 were major parts | 250 total, of which 35 were major parts | 250 total, of which 35 were major parts | 250 total, of which 35 were major parts |

* After data compiled by C. F. Kraus, Baldwin Locomotive Works

ILLUSTRATIONS

IN THE LEFT COLUMN READING FROM TOP TO BOTTOM: THE FIRST THREE LOCOMOTIVES WERE BUILT IN 1905. THE FOURTH, FIFTH, AND SIXTH IN THAT COLUMN ARE LOCOMOTIVES BUILT FROM 1910 TO 1913. THE LAST TWO LOCOMOTIVES IN THE LEFT COLUMN, THE ONE IN THE TOP CENTER, AND THE FIRST TWO IN THE RIGHT COLUMN ARE LOCOMOTIVES BUILT IN 1918. THE THIRD, FOURTH, AND FIFTH IN THE RIGHT COLUMN WERE BUILT FROM 1923 TO 1925. THE REMAINING THREE IN THE RIGHT COLUMN AND THE ONE PICTURED BELOW WERE ALL BUILT IN 1930



Although a Diesel locomotive was built in Switzerland in 1911, the first American-built Diesel was not produced until 1924, and up to now, there are less than 125 in use in this country. Most of these are of low power, around 300 to 400 horsepower (900 is the largest), and their employment has been confined to industrial and light transfer service.

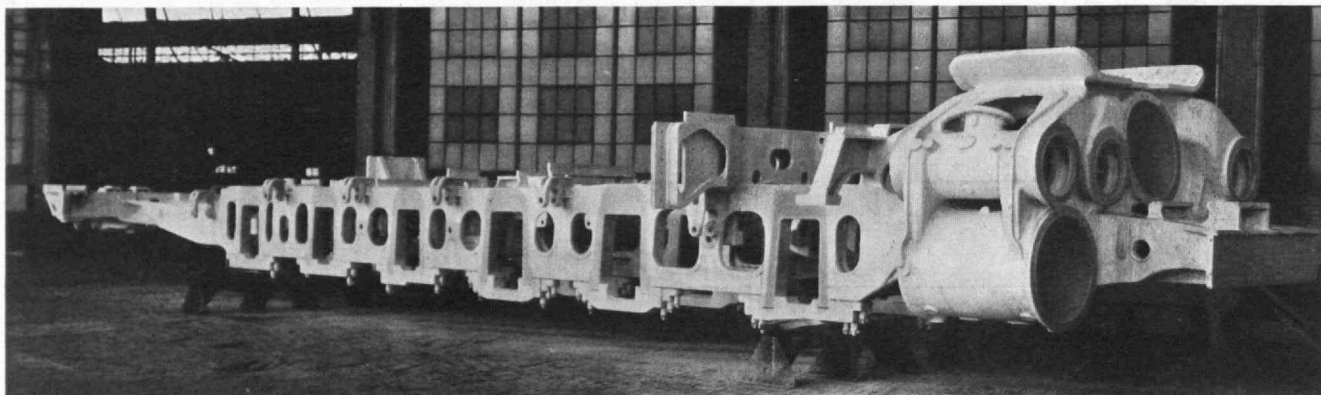
None in the United States has been developed for main-line usage. The experimental two-unit Diesel, each unit having 1,330 horsepower, built by the Canadian National, is the largest on record. There seems to be no impending solution to the problem of building a Diesel locomotive of 4,000 to 5,000 horsepower, which would be comparable with the rating expected for present-day, main-line service. It cannot be denied, however, that the Diesel with its promise of lowered operating costs is to be reckoned with in an inventory of American railroad's future motive power facilities.

Like the electric, the Diesel is a potential threat to the realm of steam, but it seems quite likely that steam will maintain its prestige for many years to come in so far as the bulk of the country's rails are concerned. One very

articulated compound in the United States had been built from the designs of J. E. Muhlfeld. The principle of the articulated locomotive, which was the invention of Anatole Mallet by whose name it is commonly known, divided the locomotive frame into parts connected by a hinged joint and doubled the permissible number of driving wheels. The resulting great tractive effort proved a boon in handling heavy trains on heavy grade lines, especially where speed was not of prime importance.

Shortly after the close of the period 1905-1910 found the superheater in general use, the wide firebox and brick arch, the Walschaert outside valve gear. The first of these was beyond question the greatest forward step in locomotive engineering since the invention of the locomotive itself. With the superheater it was possible to realize in the simple engine economies equal to or better than those of the saturated compound. Year by year after 1910, stokers came more into general use on larger engines, the feedwater heater had chances for trial experimentally, and general practice called for the substitution of cast steel for cast iron in the chassis.

With the close of the Great War economy and speed



Commonwealth Steel Castings Corporation

ONE PIECE CAST STEEL LOCOMOTIVE BED. UNTIL RECENTLY A LOCOMOTIVE BED WAS MADE UP OF 250 SEPARATE PARTS

important fact supporting such a conclusion is furnished by the transformation of the steam locomotive's design since the time of the accident in the Park Avenue tunnels nearly 30 years ago.

Except for size and the number of driving wheels, the standard steam locomotive of that time differed little from the typical one of the Civil War period. The Stephenson Link Motion was about its only economy device. Three American (4-4-0) locomotives delivered to the Central of New Jersey in 1906 weighed 158,000 pounds with a weight per driving wheel of 27,000 pounds; otherwise, they resembled the heaviest locomotive of 1881, an American on the Reading, which had a total weight of 96,200 pounds with 16,000 pounds per driver.

The point had come, nevertheless, when locomotive designers recognized that demands for increased power could not for long continue to be met merely by building larger locomotives. Hitherto, the limits of height and width had been ample for expansion and heavier rails could be laid to cope with the extra weight. Fuel was comparatively cheap and the size of locomotives too great to be fired by hand had not yet been attained. To be sure, the compound engine had been used to reduce the fireman's task by saving fuel, and in 1904 the first

became of major interest to the railroads. Costs of fuel and other materials had risen as well as wages, the return of their property from government operation found many of the carriers financially embarrassed. Besides the public demanded faster freight movements, and "gross ton-miles" was superseded as the yardstick for measuring railroad freight capacity by "gross ton-miles per engine hour." In the West particularly, speed loomed as the only way to offset the cheapness of water shipment via Panama. Thus came locomotives with higher steam pressures, with capacities entirely beyond the possibilities of handfiring, with 1,100 horsepower output per driving axle instead of the 500 to 600 which denoted a good machine of the immediate pre-War years, with feedwater heaters as standard equipment, with a one-piece cast steel bed replacing 250 parts of the older engines, with tenders thrice the size they were in 1905. The table and illustrations on the preceeding page present the highlights of the last quarter century of the steam locomotive's family tree.

To exemplify the recent improvement in steam locomotive design, a writer in a recent number of a popular magazine says, "Whereas in 1922 the steam engine required 163 pounds of coal to move 1,000 tons one mile, by 1929 it required only 125 pounds, (*Continued on page 420*)

THE PILL OF IMMORTALITY

A Translation from the Chinese of the Earliest Known Treatise on Alchemy Reveals Some Second-Century Miracles

BY TENNEY L. DAVIS AND LU-CHIANG WU

See page 364

LATER Chinese alchemists refer to Wei Po-yang as the "Father of Alchemy" and regard his *Ts'an T'ung Ch'i* (Akinness of the Trio) as the earliest treatise in the Chinese language which is devoted exclusively to the subject of alchemy. Although it was written in the first half of the second century, about 142 A.D., it is by no means the earliest Chinese writing which makes mention of alchemy. It shows that an extended and definite alchemical tradition already existed, and makes mention of several earlier alchemists concerning whom other information is available either from their own writings or from the historical books.

For three or four centuries before Wei Po-yang, the Chinese had been engaged in an effort to transmute base metals into gold — not because gold was intrinsically valuable, but because the magical efficacy of artificial gold was such that the eating of food out of vessels made from it would produce longevity — and they were attempting to prepare the elixir of immortality from cinnabar. The similarity of the methods and aims of the Chinese alchemists with those of the later Greek, Arab, and Latin Europeans suggests that all alchemy derives from a single origin. While it is possible that the appearance of alchemy in China in the second or third century B.C. resulted from the influx of alchemistic teaching from Egypt or from Mesopotamia, we have no early alchemical documents from the latter places — and the *Ts'an T'ung Ch'i* of Wei Po-yang appears to be the earliest treatise entirely on alchemy with which we are at present acquainted.

Chinese alchemy, like all of Chinese science, is erected upon the fundamental concepts of *Wu-hsing* (the Five Elements) and *Yin-Yang* (the Contraries). These are genuine scientific concepts which supply categories for the description of natural things.

The notion of *Wu-hsing* (the Quintet; water, fire, wood, gold or metal, and earth) as a scientific concept remounts to the twelfth century B.C. Since about the third century B.C. it has carried a magical connotation as well, the Five Elements being associated with the five seasons, the five

locations, the five colors, the five tones, the five tastes, the five animated species, the five internal organs, the five ways of righteous conduct, the five social relationships, the five grains, the five domesticated animals, and so on.

Although the idea of the Contraries, by the interaction of which all things in the universe are produced or created, was developed as a philosophic dualism by Confucius in the sixth century B.C., the doctrine of *Yin-Yang* in which the Contraries possess both a scientific and a magical connotation did not appear in Chinese thought until about the time that Wu-hsing took on its magical relationships, until about the time that alchemy commenced to flourish. The circumstances create a strong presumption that the idea-system which includes alchemy and magic and *Yin-Yang* was introduced into China from some other civilization.

Yin was the female principle, undesirable, heavy, gross, passive, cold, and dark. *Yang* was the male principle, desirable, light, active, hot, and fiery. Together they were the *Liang I*, or the two regulating powers, and constituted the soul of the universe. Wei Po-yang in the *Ts'an T'ung Ch'i* positively identifies *Yang* and *Yin* with the Sun and Moon respectively. The Sun and the Moon, we know, were the two prime powers in the religions of Babylonia and Egypt. We find in Chinese alchemy a parallel of the teaching of Hermes Trismegistos who says in the Emerald Table that "the father of it is the Sun, the mother of it is the Moon."

The Chinese alchemists were Taoists and their writings have been preserved as a portion of the canon of the Taoist religion. The texts which have come down to us are probably authentic. A number of scholars have believed that alchemy was indigenous to China, a natural and spontaneous outgrowth from the magical and fantastic side of the Taoist religion, and have adduced good reasons for the opinion. Their argument loses much of its strength when we consider that the pure mysticism of Lao Tzŭ, the pursuit of the *Tao* or Way, after remaining a more or less abstract philosophic doctrine for



WEI PO-YANG WITH HIS DOG AND HIS DISCIPLE, ALL OF WHOM, ACCORDING TO THE STORY, ATTAINED IMMORTALITY BY CHEMICAL MEANS



FROM A TWELFTH CENTURY CHINESE TEXT ON ALCHEMY. NOTE THE FURNACE RESEMBLING THE KEROTAKIS OF THE ALEXANDRIAN ALCHEMISTS

moned to Court but refused the invitation because he had no liking for officialdom. In the Epilogue of the *Ts'an Tung Ch'i* he describes himself as "a lowly man from the country of Kuei, who has no love for worldly power, glory, fame, or gains, who wastes his days leading a simple, quiet, leisurely, and peaceful life in a retreat in an unfrequented valley."

THE *Ts'an Tung Ch'i* is one of the Taoist Classics and purports to be a commentary on the Book of Change but is really a treatise on the preparation of the pill of immortality. The *Lieh Hsien Chuan Tsuan* (Complete Biographies of the Immortals) says that Wei Po-yang "entered the mountains to make efficacious medicine. With him were three disciples, two of whom he thought were lacking in complete faith. When the medicine was made, he tested them. He said, 'The gold medicine is

about three centuries, underwent a sudden expansion into a great religion and, in expanding, took on magic and superstitious practices, Yin-Yang, and alchemy. At any rate, it is established that the doctrine of the Tao provided a fertile medium for the growth of alchemy.

Wei Po-yang was a Taoist philosopher and alchemist, a native of Wu in the present province of Kiangsu. In the year 121 A.D. he was sum-

moned to Court but refused the invitation because he had no liking for officialdom. In the Epilogue of the *Ts'an Tung Ch'i* he describes himself as "a lowly man from the country of Kuei, who has no love for worldly power, glory, fame, or gains, who wastes his days leading a simple, quiet, leisurely, and peaceful life in a retreat in an unfrequented valley."

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In many respects the *Ts'an Tung Ch'i* bears a strong resemblance to the later alchemical treatises of the Europeans. The author mentions the obscurity of earlier writers and states that he is making an effort to be clear in spite of his feeling of inferiority and inadequacy for the task. His description of the processes is about as lucid, or about as obscure, as the descriptions of the mediaeval alchemists. He gives symbolic and imaginative names to many of the substances which are used, and insists upon the necessity for careful and accurate compounding and for a cautious interpretation of the text which, he says, he has intentionally obscured in places. He has a keen sense of humor and a proper appreciation of the value of grotesque illustrations in an argument. He gives really poetic descriptions of the effects of the pill of immortality.

The following passages are quoted from a complete translation, by one of the authors of this article (Wu), of the *Ts'an Tung Ch'i* which is now being edited for publication.

"Descriptions of processes are many and varied, numbering upward of ten thousand. Most of them violate the doctrines laid down by Huang Ti and Lao Chün, and being awkward are also out of accord with Chiu Tu.

"Wise men, understanding this principle, know clearly what course to follow. They practice with diligence day and night. Having eaten the medicine for three years, a man attains buoyancy of movement and is able to travel great distances. Stepping over a fire, he is not scorched; dipped into water he does not get wet. He is



DRAWING OF A STILL FROM A THIRTEENTH CENTURY CHINESE TEXT

able to appear and to disappear at will. He will be happy forever. Having attained the *Tao* (Way) and the *Ti* (Magnanimity-virtue), he hides himself to await his time. In time, *Tai I* (the Supreme One) will give the order for him to remove his residence to Chung Chow (Central Isle). Thence, upon fulfilment of the required deeds, he will be raised on high and duly ordained.

"In order that the Treatise on Fire shall not have been in vain, I shall explain here in simple language. Like the moon lying on its back is the shape of the furnace and the pot. In it is heated the *Pai Hu* (White Tiger). *Kung Jih* (Mercury Sun) is the flowing pearl and with it is *Ch'ing Lung* (Blue Dragon). . . .

"When gold is placed in a hot fire, it is not deprived of the brilliancy of its color. Since the days of the unfolding of the universe (Creation), the sun and the moon have not diminished in brightness nor has gold lost any weight. The shapes of the sun and of the moon have always been the same. Gold is born under the influence of the moon. At daybreak, receiving magic force from the sun, it returns to its mother. Being enveloped by the sun at the wane of the moon, it hides within the walls and abandons itself to inanity. Thus does the gold regain its original nature. Only when intense brightness is obtained is the *Ting* (furnace-pot) well heated. . . .

"Yellow earth is the father of gold and flowing pearl the mother of water. Earth is the *Kwei* (ghost) of water, and it is not able to arise because of the over-bearing of the earth. The *Chu-ch'ueh* (Red Bird) is the spirit of fire and dispenses victory or defeat with justice. With the ascendance of water comes the vanquishing of fire. Dying together they return to Mother Earth. The three natures merge together and thus show their common origin.

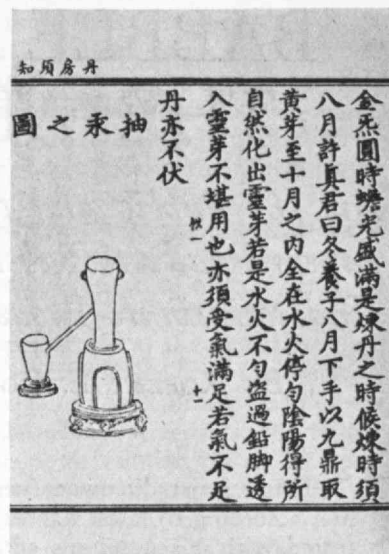
"Longevity is of primary importance in the great triumph. *Huan Tan* (Returned Medicine) is edible. Gold is non-corruptible in its nature and is therefore the most valuable of things. The *Shu Shib* (Men of the Art, Magicians) feeding on it attain longevity. Earth, traveling in all seasons, delineates the boundaries and formulates rules to be observed. The *Chin Sa* (Gold Dust), having entered the five internal organs, spreads foggily like wind-driven rain. Vaporizing and permeating it reaches the four limbs. Thereupon the complexion becomes rejuvenated, hoary hair regains its blackness, and new teeth grow where fallen ones used to be. If an old man, he will once more become a youth; if an old woman, she will regain her maidenhood. Such transformations make one immune from worldly miseries, and one who is so transformed is called by the name of *Tsun Jen* (True Man).

"*Hu* powder, on being placed in the fire, becomes discolored and changes back into lead. On treatment with hot liquids, ice and snow dissolve into *T'ai Hsuen* (the Extremely Intangible). Gold is chiefly made up of sand and derives other properties from mercury. The transformations concern only the essence of the materials. Causes and effects are traceable in the course of the changes. The way to make oneself a *Fu Shib Hsien* (a Drug-using Supernatural Being) lies in the use of drugs of a nature similar to oneself. For rice seeds are used in the raising of rice, and chicken are hatched from hen's eggs. Things found in nature, when given proper help according to their kind, will result in things easy to improve. Fish eyes cannot replace pearls, and tall weeds

cannot be used for timber. Things of similar nature go together: queer things cannot be realized. This explains why the swallow does not give birth to peacocks, and the fox and the rabbit do not mother horses. This explains also why flowing water does not heat up what is above it, and why moving fire does not wet what is under it.

"Many are the learned scholars, but they are too profound to be understood and are therefore lost to the world. They never meet with good fortune: their belongings are devoured by devastating fire. They follow the printed word and sometimes they follow their blind inclinations. The start they make is improper and subsequent regulation is wanting. *Chiang Shib Tan* (a kind of stone), *Yün Mu* ("cloud mother" or mica), and alum are crushed together and cured. Sulfur is burned with elm wood. Mud and mercury are treated in a mixture. These form the support and pivot of the five stone coppers under the drum. Things of different nature and kind are unwilling to unite and live together. Ten thousand failures will come from a thousand attempts. Doubts will fill the heart in middle age. The right course has been abandoned to follow the mistaken path, and the view is too narrow for proper judgment of the future. . . .

"The Treatise on Fire comprises six hundred chapters which treat of the same subject. They are so cautiously worded that they are not easily understood by people of the world. When things are traced back to their origin, it will be found that the bright and the dark (the obvious and the obscure) are in close union. A profound subject like this is fit to be treated only by the wise. It is presumptuous therefore for me to write on it. But I cannot hold my peace either; for it would be a (Cont. on page 418)



DRAWING OF A STILL FROM A
TWELFTH CENTURY CHINESE TEXT



DRAWING OF A MORTAR FROM A
TWELFTH CENTURY CHINESE TEXT

BABBLE IN THE AIR

Are the Public and the Newspapers Ready to Rebel Against Indiscriminate Broadcasting?

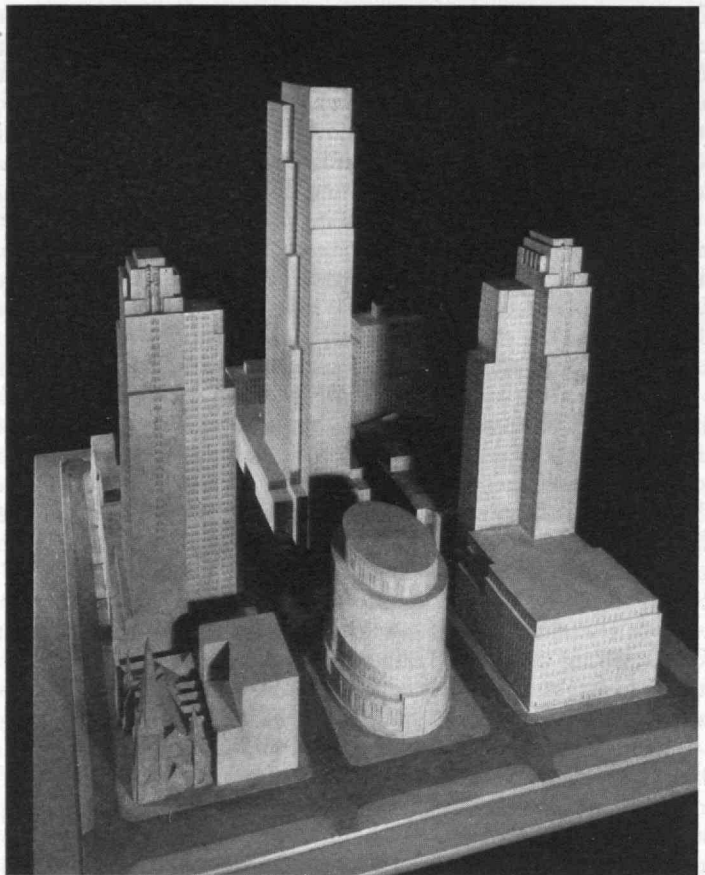
BY ROBERT E. ROGERS

See page 368

IS THE American radio owner (nearly 15 million of him according to latest figures) getting discontented with his evening's entertainment? One might think so. Only this past week, while I have been mulling over this article, with one ear more than usually cocked toward the loud speaker, I have detected an undoubtedly apologetic note in some of the advertising announcements, a note which certainly didn't use to exist. One speaker said quite frankly that the program existed for its advertising value and that the sponsors (a two-dollar word) hoped to make the advertising as interesting as the program. They didn't. Another, advertising a cigar, read a long paragraph, which said incidentally some nice things about the cigar while explaining that he was going to use only 20 words to advertise the cigar. Count 'em — 20! A third announced that his program was to be "a salute to advertising" in gratitude for its services to radio. Remembering William Orton's assault in the January *Atlantic Monthly* called "The Level of Thirteen Year Olds" and his more technical but still forthright sequel in April, "Unscrambling the Ether," one is inclined to believe that straws show which way the wind blows, that chickens come home to roost, that vinegar never catches flies, and other homely proverbs.

Another question arises: Is the American press getting fed up with radio competition in both advertising and news-distributing to the point of taking steps? In Karl A. Bickel's excellent little book, "New Empires," he says: "The broadcasting industry, somewhat conscious of its remarkable development over the past five years, is pushing along under forced draught, apparently determined to risk a newspaper break in its efforts to develop both its advertising and news fields to the furthest extent. Resentment among newspaper publishers against broadcasting is growing steadily. Newspaper antagonism to broadcasting which was smoldering three years ago, and then pronouncedly declined, is flaming up again. If the issue went to a real struggle today, unquestionably the newspaper would win and broadcasting would receive a definite setback."

Let us take the newspaper situation first, condensing a good deal of material drawn from "New Empires" and from *Editor and Publisher*, always very keen on the issue, about the attitude of the press toward the encroachment of the radio on its field.



Bradley
A MODEL OF THE PROJECTED ROCKEFELLER OR RADIO CITY IN NEW YORK
— TERMED BY LEWIS MUMFORD "THE SORRIEST FAILURE OF IMAGINATION AND INTELLIGENCE IN MODERN AMERICAN ARCHITECTURE"

Radio is a bit more than ten years old. The first important newspaper broadcast of news was from KDKA and covered Harding's election in 1920. The first news event to be generally broadcast was the Dempsey-Carpentier fight in 1921. By Coolidge's election in 1924 the present system was well under way, and the two great broadcasting chains are developments of the past five years. Today there are estimated to be some 14,500,000 radio sets in operation. In 1927 the newspaper publishers determined to eliminate all reference to advertisers in their radio programs but gave up the attempt after a brief and inconclusive trial. Today the question is being raised again seriously.

"The publishers of 90 American newspapers either own or coöperate in the management of radio stations," says Mr. Bickel. On the other hand, Hans V. Kaltenborn, who "edits the news" over the air, said in a recent issue of *Editor and Publisher* (February 8) that "whereas 80 newspapers owned their broadcasting stations when broadcasting first began, only about 40 dailies now have broadcasting plants." The first tie-up of newspapers with radio is said to have been due to a suggestion of a Pittsburgh newspaper which led to the establishment of KDKA and, in the main, of present policies of radio entertainment and news dissemination.

Today the National Broadcasting Company pays some three million dollars a year in telephone tolls. Broadcasting costs on the two major chains increased from \$3,760,000 in 1927 to \$18,729,000 in 1929. "Statistics for

the current year indicate that the total for 1930 would reach \$30,000,000," according to Mr. Bickel's figures as of May 3, 1930, and according to Mr. Orton in the January *Atlantic Monthly*, advertising rates are about \$4,000 an hour on the blue network of N.B.C., and \$6,000 an hour over the red network. An hour on the coast to coast chain with both systems costs \$20,000. A local Boston station with only a New England distribution will charge \$100 for 15 minutes of a daylight hour. Evening rates are, of course, much higher. Salaries of radio entertainers are going up in proportion. The Shell Gasoline Company is said to be paying the conductor of its morning hour at the rate of \$100,000 a year for three years. Rudy Vallee and his orchestra get \$2,500 a week, the Firestone Tenor and Graham McNamee \$1,000 a week apiece. Harry Lauder once got \$30,000 for two 15-minute periods the same evening. (*Editor and Publisher* for February 14.)

This gives a little idea of the growth of the past five years and of the financial power of the two networks: the National Broadcasting Company, which is the General Electric, Westinghouse Electric and Radio Corporation of America; and the Columbia, closely associated with the Paramount-Publix theatre interests. In other words, the Power Trust and the Film Trust have strong fingers in our radio entertainment. The complete picture may be studied in another new book, "This Thing Called Broadcasting," by Dr. Alfred N. Goldsmith, Vice-President and General Manager of the R.C.A., and Austin C. Lescarbourea. And in the near future we shall see the great "citadel of radio" covering the blocks between 48th and 51st streets and Fifth and Sixth avenues, housing broadcasting, television, opera, drama and films. It is to be devoted, as *The New Yorker* remarks sadly, "to opera and radio, the first of which is probably the stuffiest and least effectual form of art and the second of which is certainly the most nervous and æsthetically disappointing manifestation of science."

Anyway, radio is important. But so is the newspaper and the press in general; and the newspapers are getting peeved. They are threatening a resumption of the boycott on advertising space in the radio program columns unless newspaper advertising space is also taken. Here and there, there are signs that they are unwilling to share news with the radio. The Washington *Post* has discontinued its morning news broadcast; three Tacoma papers are discontinuing publication of their radio programs; the Minnesota Editorial Association threatens newspaper boycott on radio and calls on press associations to withhold news from the air. Conferences both in the South and on the coast start action against radio lotteries, permitted on the air but forbidden in newspapers. California publishers are looking into the matter of advertising, too. It seems to be true that while newspaper and magazine advertising fell off during 1930, radio advertising increased disproportionately. Newspapers resent particularly having to give publicity in their radio news columns to firms which have dropped newspaper for radio advertising. When they are asked in addition to give "reading notices" as news, they think it the last straw.

More serious is their contention that although newspaper advertising, for the past 20 years at least, has been clean, honest and well-regulated, present-day radio

advertising, and particularly local advertising, shows all the abuses of old-time journalism. Blue sky stock advertisements that would be barred from a reputable newspaper and are, indeed, barred from the mails, flourish — over the air. Lotteries cannot be prohibited — over the air. The faker and charlatan, the quack doctor of either body or mind, the patent medicine vendor, the crystal gazer, fortune teller, astrologer, psychic, all make money — on the air. Even the large advertisers employ numerologists and astrologists instead of jazz bands to entertain the public. These, of course, offer their services free to the advertisers' public and at the same time they are building up private practice in fields which the average person of today is inclined to look upon as not entirely reputable. But the direct advertisers, the fellow who sells a stock horoscope for a dollar, the sucker stock salesman, these make money among precisely the people whom the newspapers cannot reach, the ignorant, who are powerfully moved by the persuasive power of the spoken word.

The one hopeful step in this connection is that recently the Court of Appeals of the District of Columbia upheld the Federal Radio Commission in revoking the radio license of a Kansas physician who owned his radio station, advertised his practice and hospital, made diagnoses from letters and prescribed, over the air, remedies to be bought by number at a chain of drug stores.

The newspapers also complain that at present there is no possibility of copyrighting radio material, so that a newspaper using the air for spot news or an air "extra" has no protection. The contention is that in all these matters the legal status of radio and newspaper should be the same.

ONE of the signs of this newspaper discontent has been the cavalier attitude of the newspaper sports writers toward their brothers on the air. They know that cold print the next day cannot compete with the human voice, warm and excited, of an announcer with personality, as he calls off the game play by play or the fight blow by blow. So the newspaper boys have taken to impugning the accuracy of these spot impressions. Their never-ending razzing of Graham McNamee is old sports history. And one remembers the morning when the boxing writers agreed unanimously on the bloody messiness of a major fight which, over the air the night before, had been a gentle and bloodless affair.

There is a strong body of newspaper opinion, however, that believes that radio cannot hurt the newspaper, that spot news flashes or the special sports broadcasts really do send the fan to the newspaper for more full and more considered accounts, and that there is no better newspaper publicity than the morning and evening radio bulletin, which in its tantalizing brevity sends the listener to the newspaper for the details. In the same way, these apologists point out that no one turns the dial to pick out advertising — rather he seeks to avoid it — whereas in the newspaper he really looks for it and reads it carefully. These people consider the radio a feeder for the newspaper rather than a dangerous competitor. Moreover, advertising time on the radio is strictly limited by the nature of time, whereas the paper can add advertising pages indefinitely. Nevertheless, should newspaper

advertising seem to decline in proportion to the growth of radio, or should the broadcasting companies go into the business of supplying news directly to the public on any large scale, the press will undoubtedly set itself for a battle.

SO MUCH for the newspaper and the broadcaster. Let us turn now to the more important indictment of William Orton in the *Atlantic Monthly*. It is briefly that, in spite of the high praise given by President Hoover, the Federal Trade Commission, and the broadcasting companies themselves for the high cultural quality of radio programs as developed under competitive business methods supported by advertising, more and more of the intelligent public, in whom the hopes for radio were so high, are refusing any longer to turn the dial. They are sick to death of an almost unrelieved succession of dull advertising, cheap humor, second-rate singing, and redundant jazz. The article is an attack on the traditional American philosophy which is so afraid of government regulation that it has allowed radio control to get out of hand, and big business has taken advantage of this fact. Not until 1927 was the government able even to allot channels and license stations. Today large numbers of small local stations need to be eliminated, not only because of poor programs, but because they have a nuisance power of interference far out of proportion to their direct useful broadcasting power. The courts, however, have already ruled in one case that a pioneer station may be said to have a vested interest in the air beyond the power of the Federal Radio Commission to eliminate it.

MR. ORTON points out that they "do these things better in England." "In England, this week, I could obtain at least one full orchestral program every night, including whole evenings of Bach, Beethoven, Wagner, and modern work. I could hear the Mozart Festival at Salzburg and the Vienna Philharmonic under Baumgartner. I could listen to Eugene O'Neill's 'Ile,' to a first-class debate on the international language question, to two or three recitals of modern chamber music, to a couple of revues (complete), to say nothing of dance music, political addresses, educational programs, and so on. . . . And all for the license payment of two dollars a year."

He also points out, as does Mr. Kaltenborn, that the time on the air for "unsponsored" educational and cultural programs is growing less and less, and those only in the daytime hours; that it is impossible to get time for "education" in the evenings; that time units have been steadily cut down from an hour to 30 minutes and that 15 minutes is becoming the norm; and that one can never be certain that an intelligent and interesting feature won't be replaced by one comparatively worthless because the first does not pay. (I, myself, know of cases where people bought good radios chiefly to listen to a coffee company's broadcast of the Boston Symphony, only to have it discontinued the following season and dance music substituted.)

Both Mr. Orton and Mr. Kaltenborn mention the fact that the Advisory Commission on Radio Education under the Secretary of the Interior came to the conclusion that nothing could be done for education on the air unless a

fund were raised by private subscription to pay for it. The report also shows that the careful and intelligent plans of Columbia University, New York University, and the Division of University Extension of the State of Massachusetts, a pioneer in the field, to furnish genuine radio education came to nought because the commercial stations would not coöperate except by granting 15-minute snippets of time during the dull non-commercial hours of morning and afternoon.

I know from personal experience that the able efforts of the Massachusetts Department of Education to conduct radio courses have met with less and less success in past years because chain and local advertising is swallowing up all the available time. When the work started in 1923-24 the courses were very successful, by actual registrations and fees paid, and brought splendid response from the public. An account of these early experiments is given in *The Technology Review* for May, 1925. Today the same public exists, eager to learn, and is choked off by the necessity for advertising revenue. The big broadcasting companies profess themselves sympathetic but will do nothing. The school system is apathetic. There are some 5,000 schools equipped with radio in England and some 1,600 in the United States. Recently the Corporation Counsel of Boston rendered a decision that public school funds could not be used for radio education. Even in a large number of stations supposedly operated by educational institutions the average of actual time devoted to education on the air has been shown to be some eight hours per week. The rest is presumably advertising.

THE average American will not believe that Mr. Orton's chief contention, our American government being what it is, is valid. There can be no doubt that radio development in America has made its enormous technical and physical advances through private enterprise and competition. Every intelligent American knows that this method has enormous cultural disadvantages, particularly for the superior citizen. The disadvantages, nevertheless, are of the sort that can be remedied by slow and patient effort and pressure, whereas the disadvantages of government operation and control are not to be eliminated. Radio programs are better than they were five years ago. They will be better still five years from now, particularly if the present dissatisfaction with pure advertising increases and becomes vocal. But not unless the present system breaks down from extravagance and lack of revenue will our public become interested in license fees and centralized control of programs. What will happen is that the manufacture of radios will presently be centered in a few great coördinating companies with vast financial resources drawn from the electrical industry in general. Those companies will be forced to spend far more money than at present in "good will" presentations free from the present obnoxious advertising.

I hold no brief for education by radio. I do not particularly believe in its value. At best it has all the disadvantages of the lecture method of teaching without the chief advantage of that method, the immediate presence of a strong teacher who can focus interest through sheer personality. The talking picture seems to me a far more significant and potentially useful form of "mechanical" education.

(Continued on page 422)



Colder Light

Almost all our present sources of light are hot bodies, 95% of whose radiation is invisible. To light a lamp as a source of light is about as wasteful of energy as to burn down one's house to roast one's pork. It is a fairly safe prophecy that in 50 years light will cost about a fiftieth of its present price, and there will be no more night in our cities.

— J. B. S. Haldane

HALDANE made this prophecy in 1923. What progress has been made in the eight years that have elapsed and what are the chances of a fulfillment in the next 42 years?

To both questions, encouraging answers may be given. From two different directions scientific battalions have been hammering away at this stubborn salient, and while they have not closed in, they have gained important vantage points. The chemists and physiologists are penetrating the mysteries of chemi- and bio-luminescences (approach number one) and the physicists have learned much about electrical discharge through gases (approach number two).

The problem, of course, is to develop a source of light which radiates selectively, or in other words, which gives off the wave-lengths which affect our eye, emitting a minimum of those which do not. The radiation of the incandescent lamp consists of about 5% visible light and 95% invisible heat — an appallingly inefficient contraption as Haldane points out. The lowly firefly has a vastly superior method of producing light. By a process of bio-luminescence, resulting from the oxidation of a compound called luciferin, the firefly emits an almost pure, visible light with an increase in temperature of only a few thousandths of a degree.

In a radio talk delivered a short time ago, Dr. E. Newton Harvey, Princeton Professor of Physiology, discussed the subject of luminescences, with particular emphasis on the firefly's lighting plant, and gave as his opinion "that it is perhaps too soon to predict what may be the commercial future of cold light, but it is worthy of emphasis that such a development would be a very decided step in the right direction . . . the cold light of animals has been the goal of the illuminating engineer."

The statement has been made that an area of firefly light six feet in diameter on the ceiling of a room nine feet high would give ample illumination for reading or drawing on a table three feet high. It only remains for the physiologists and chemists to synthesize the firefly's tail.



Courtesy Grand Central Art Galleries

"MAN OF STEEL"
BY MAX KALISH

Photographed by Bernès,
Marouteau and Cie

The physicists, working with electrical discharges through gases, have likewise made some very promising advances, and perhaps feel equally sure that they are working in the right direction. Two months ago The Review called attention to an announcement by Claude Neon Lights, Inc., of a new gas tube for general illumination, giving an equivalent amount of light to an incandescent system using twice the energy.

From Germany now comes word of a similar development, a sodium-krypton tube four times as efficient as incandescent lamps. The light it gives, judging from the reports, is disturbingly yellowish but, nevertheless, is being used in some new lighting installations. Dr. M. Pirani, who developed it for the Osram concern, German lamp manufacturers, has announced another tube giving light indistinguishable from daylight. Its efficiency, however, is low.

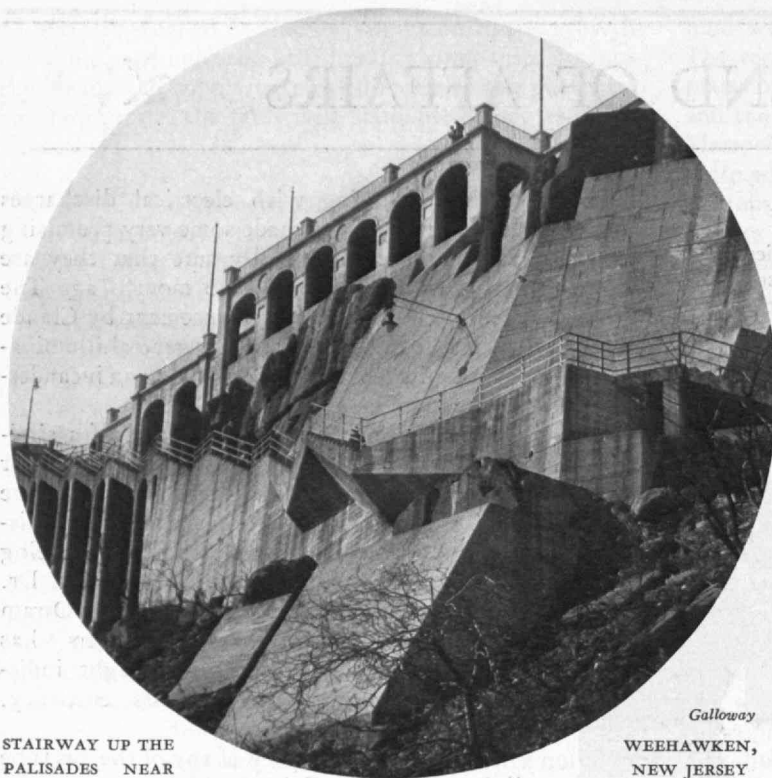
Whether the efficiency of any of the gas tube lights will be sufficiently high to offset the lower production and installation costs of incandescent light is conjectural. Be that as it may, the physicists are striving mightily to fulfill Lord Haldane's prophecy. They may do it alone or they may join with the chemists to duplicate the lightning-bug's marvelous "cold light."

Color in Industry

THAT industrial fatigue can be reduced by the use of colors is indicated by the experiment of a New England shoe manufacturer, who has found that gaily painted machines and bright garments for his workers increase efficiency, help to eliminate accidents, and make happier employees.

Much thought has been given to the elimination of industrial, mental, and physical fatigue, which often is the result of monotony of scene and repeated operations. Special lighting systems and periodic rest intervals have been tried with some success, but the use of the stimulating effects of certain colors is comparatively new. Much remains to be learned about psychological reactions to color, but their effects seem fairly well established, and the further development of their use in factories may be expected.

The New England manufacturer who is carrying on this interesting experiment in color stimulation is Alfred W. Donovan, President of the E. T. Wright Shoe Company of Rockland, Mass. Aware of restlessness and fatigue among the workers in his factories during the afternoon hours, Mr. Donovan set out to relieve the unrest. He developed a theory that uninteresting and monotonous factory surroundings, with innumerable



STAIRWAY UP THE
PALISADES NEAR

Galloway
WEEHAWKEN,
NEW JERSEY

black machines standing row on row, and the repetition of operations might well be depressing, fatiguing. After talking over the problem with a particularly high-strung and weary operator, he suggested that the man paint the machine at which he worked a bright color. The employee, somewhat skeptical, chose a light shade of green, and within a week the stimulating and restful effects of the color had produced a remarkable change in the workman's attitude. The experiment was extended to all the machinery in that particular factory, each employee being allowed to make his own choice of color. The result would have put Joseph's coat of many colors to shame, both from the point of view of varied tints and lack of taste in combining them.

The results, however, amply justified this preliminary experiment. Then Mr. Donovan called in experts, and a systematic study of the effects of color was started. A certain shade of blue was found to have a soothing effect upon workers of nervous temperament. Others were given machines painted in various delicate shades which seemed most suitable to the individual. It was also found by this study that certain colors were more effective for one class of worker than for another, and various exposures to the light were taken into consideration in the choice of shades.

The results of this experiment, which is still going on, are, according to Mr. Donovan, increasing efficiency, with a consequent speeding up of production, a marked decrease in physical and mental fatigue, less eye strain because of the elimination of many shadows, and a much improved general attitude toward their work among employees.

Another experiment in the use of colors in industries will be undertaken with the completion of the new factory of the Simonds Saw and Steel Company at Fitchburg, Mass. This factory is to be windowless, and in many other respects revolutionary in its departure from conventional design. (An extensive account of this building was given in the January, 1931, Review.) In addition to special lighting and ventilating systems, the matter of color and its effects upon workmen is being carefully worked out. The colors for the interior have been chosen for their effects in stimulating a cheerful and active frame of mind. These include blue, green, and white for the walls and ceilings. Blue was chosen for its ability to reflect certain rays. Green is an energizing component, while white heightens the sensation of light and reflects cleanliness. Orange was selected for the machinery because of its high visibility, which will emphasize the moving parts and so aid in preventing accidents.

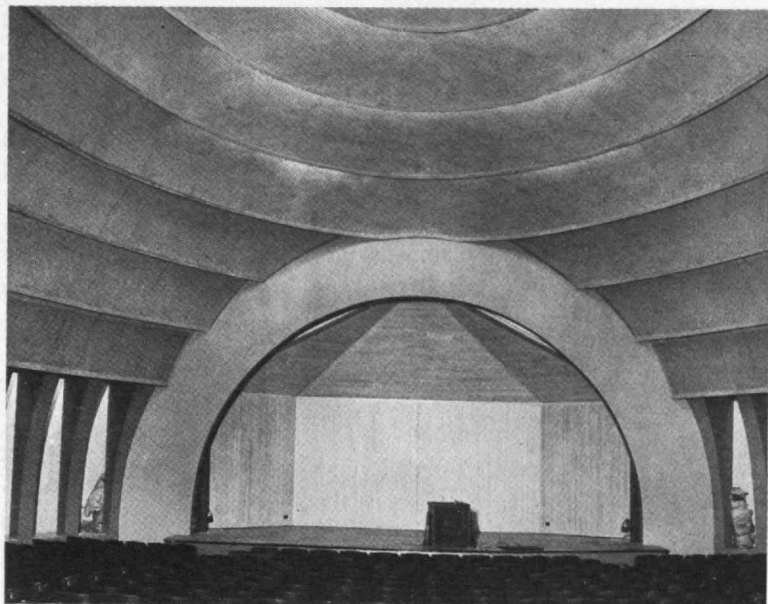
Glycerine, Chemical Pooh-Bah

MOST people, when glycerine is mentioned, think of it as having only three uses: for making dynamite, for making anti-freeze compounds for radiators, and for mellowing and aging forbidden beverages (perhaps this latter use should be combined with the first-mentioned one). This conception, however cheerful, is somewhat limited, for glycerine has become one of the most versatile of liquids.

It has uses that range from bread making to steel tempering; from anti-freeze solutions to sweetening marmalade. As a matter of fact, the baker and the confectioner have long used glycerine for improving the quality and lasting characteristics of bread, cakes, even currant buns, and candies. Devotees of buns, particularly the Hot Cross variety, will find satisfaction in the news that currants



THE BEAUCATCHER TUNNEL, ASHEVILLE, N. C.



Underwood and Underwood

OVAL AUDITORIUM IN THE NEW SCHOOL FOR SOCIAL RESEARCH, NEW YORK CITY. DESIGNED BY JOSEPH URBAN

treated with glycerine retain their moisture longer and, thus rejuvenated, add new delight to an old-fashioned favorite. It is quite likely that other dried fruits will be improved by the use of glycerine.

In baking, this very adaptable chemical, obtained by saponification of natural fats and oils, aids in maintaining moisture, which is an important factor in the keeping of breads and cakes. It is now believed that it also helps to retain flavors, natural and artificial, that otherwise are destroyed or impaired during baking at high temperatures.

Glycerine has attracted the attention of the physician because of its value in making marmalade for sufferers from diabetes. In this use it takes the place of sugar, and in ordinary jams the flavor, texture, and keeping qualities are improved by the addition of a certain amount of glycerine.

Eggs, as everyone knows, do not improve with age, and here, again, glycerine has proved its value. It has been found that separating the yolks and white of eggs, and mixing the former with glycerine preparatory to evaporation is an excellent method of preservation for the great quantity of eggs imported from China.

The use of glycerine as an anti-freeze in automobile radiators is not new, but recently much attention has been given to the possibilities of using the chemical alone as a cooling fluid for internal combustion engines. The advantages of glycerine are that it does not expand, its boiling point is high, it does not evaporate, and it is non-corrosive. This latter quality, incidentally, makes it useful for preserving the fine edge of razor blades, which last much longer if kept immersed in glycerine after being used. Surgeons find that glycerine not only prevents corrosion on instruments and needles, but protects them from germs. This amazingly versatile chemical has also been

found valuable for storing "cold" in refrigerating units. Glycerine solutions, frozen during the working hours of shops and factories in the food industry maintain low temperatures during the night without operation of the refrigerating machinery.

One of the problems of the domestic gas industry is to remove moisture from illuminating gas before it is distributed in the city gas mains. Failure to remove moisture causes corrosion and sometimes complete stoppage by freezing. Glycerine, because of its ability to absorb great quantities of moisture, is now being used with high success as a gas drier.

In the steel industry it is widely employed as a quenching and tempering solution, the use of which gives more complete control over the hardness desired. The cooling rate of steel, for example, decreases continuously as glycerine is added to the quenching medium. The use of a proper solution makes it possible to harden no deeper than oil, while at the same time the metal is cooled more rapidly.

The Mechanization of Agriculture, or Cod-Liver-Oil Fed Chickens

IT IS just one hundred years since Cyrus McCormick made his first demonstration of a successful reaping machine. The demonstration was accompanied by the hooting and jeering of some of the onlookers; and it was not long before he was to see reapers and threshing machines destroyed by men fearful that they might lose their jobs to these new contraptions; there was the same opposition that existed to the early cotton spinning machinery and even to the cotton gin.



THE
MERCHANDISE
MART, CHICAGO

Chicago Architectural
Photo Co.



THE BREAKING WAVES DASHED HIGH. PICTURES TAKEN DURING AND AFTER THE RECENT STORM THAT LASHED THE NEW ENGLAND COAST

Blackington



That was not an era of overproduction of agricultural products such as now troubles the economists and politicians of all nations. One hundred years ago lack of transportation took care of this. No one cared to grow more than he could use or sell to his neighbor. All the power on the farm was furnished by human beings or draft animals; and this condition was common up to a time within the memory of the middle-aged man of today.

Modern agricultural machinery really reached its development between the years 1850 and 1880. In this period were perfected the modern mowing machine, the twine binder, the cylinder thresher, and some of the modern drills and cultivators. Still the power was mainly that of animals, some few windmills and steam traction engines being in use.

Our highly specialized farm machinery is a product of the present century, and power farming, with its tractors, trucks, and electrical motors, has come into being within the last 20 years. Really, power farming is still in its infancy, but the infant is a lusty, active, and quick-growing one, and its playthings are multiplying very fast. Not only are new field implements being added almost every day, but the purely manufacturing processes on the farm are being provided with numerous new devices.

The large modern farm is developing a management system as careful as that of the modern factory. The agricultural colleges are teaching not only scientific farming, but the business principles as well. There is talk of records and costs and deterioration and profits, as well as of fertilizers and diseases and seed selection.

Not many of us who live in the cities realize the speed with which the newer methods are replacing the old. We probably have heard of the enormous western wheat farms like that of the Campbell Farming Corporation

in Montana, where there are 200 skilled workmen drawing high wages, with bonus systems; and where there are tractors, combines, and motor trucks, with a well organized machine shop for their repair. Power has reached its logical application on this 95,000-acre enterprise; and it is accompanied by that characteristic of mass production methods, a system of daily progress reports, an accounting system and a cost system.

Many other crops are having the same mass production methods applied. Potato farms in Maine; cotton fields in Oklahoma; orchards in California and Florida; and elsewhere crops of peanuts and pecans, corn and soja beans — all have their special machinery, and are adopting methods of scientific management. There are machines for digging and sorting potatoes and beets, for cutting and stripping sugar cane, for sucking cotton for the opened boll by vacuum. There is even a rumor of a cranberry picker. Everywhere are power plows and harrows, power planters, power manure and fertilizer spreaders. Insecticides and fungicides are applied by power machinery, even airplanes being used. There are collectors for boll weevils and grasshoppers.

Nor are the animals and birds forgotten. Cows are washed and milked by machinery, and the milk production rate is recorded as carefully as the output of an automatic machine or the piecework record of a machine operator. Poultry are now made to work in factories from the cradle (incubator) to the grave, confined in wire cages, never seeing sunlight or green grass, being fed cod

liver oil or subjected to ultraviolet rays instead. Both cows and hens are rated on their output, and the poor producers eliminated.

The electric current is beginning to penetrate the farming community. It is bringing with it light and heat and power, communication with the outside world and news of its markets. While the application of electric power to field operations is yet to be fully developed, all stationary machinery can be electrically driven, water pumped, silage cut, feed ground and hay stored. In her house, the farmer's wife has her tasks lightened by this agency.

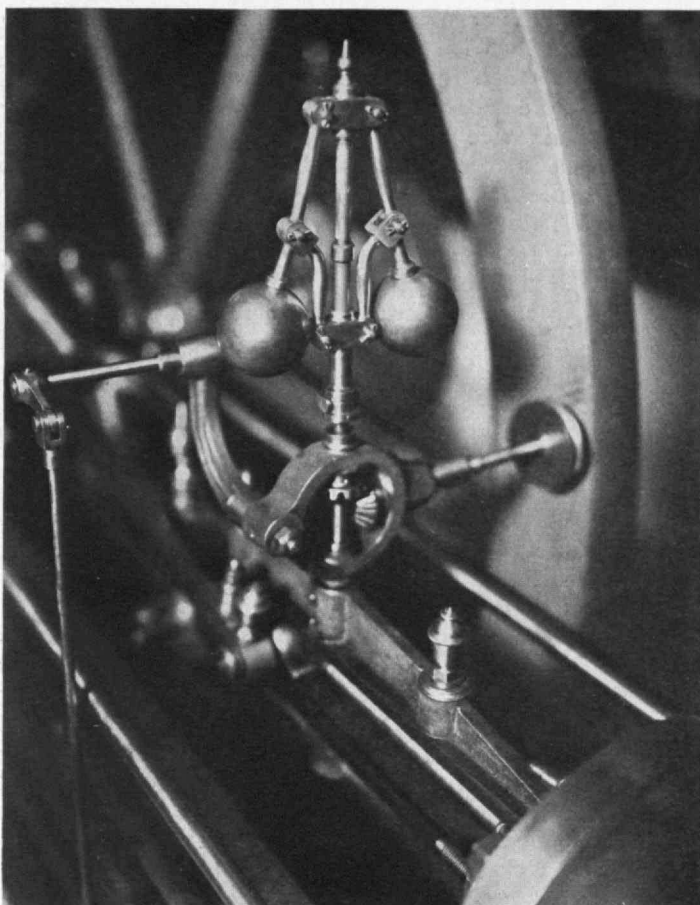
The advent of mechanical and electrical power on the farm was at first regarded solely as bringing a saving of human and animal labor. But now it is also being looked on from the standpoint of profits. The machine must do its work more cheaply, producing the same result, or it must do it better at the same or less cost. Statistical tables and graphic charts are beginning to appear on the modern mechanized farm. There is a thriving organization of agricultural engineers, and many experiment stations are devoting time to agricultural engineering.

The small farmer, and especially the small tenant farmer, is laboring under an increasing disadvantage. It will be the worse for him in the years to come. His experience during the year past has been pitiful. But he must go the way of the handicraft workers — either devote himself to some high-priced specialty, or enter the ranks of the operators of farm machinery. The plans of the U. S. S. R. for agricultural development foreshadow his future — the mechanical age for agriculture is just around the corner.

Cleaning the Billboard Purlieus

YEARs ago, before the advent of the automobile, when the highways were lanes of leisurely travel, one who journeyed by horse and buggy had ample time to read the rambling message of the country storekeeper who sought to stimulate sales by listing his goods on the silvering boards of roadside fences. Out of the dusty memory of those quiet roads come crudely lettered legends about calico and cotton goods, clothing and shoes, currycombs and axle grease, kerosene and salt pork. Leaping from board to board, usually in a single line, those early forerunners of the ubiquitous outdoor advertisements of today bespoke the shrewd ideas of the late lamented keeper of the general store. His homely sales message, however, never obstructed the scenery, and carried none of the boastful, blatant claims of his successors.

Today outdoor advertising is turning the highways into oppres-



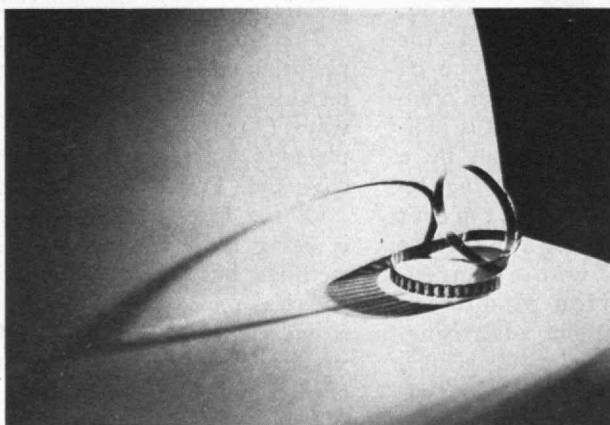
MECHANICAL STILL LIFE

Krull

sive canyons with billboard walls that shut out the natural beauty of the countryside. It mounts the house-tops to shriek its claims in light at night; from Bunker Hill to Golden Gate, from every highway, rouge and religion, cigarettes and shaving soap, pills and philters solicit the consideration of the passerby with insolent assurance of attention. When Gilbert K. Chesterton, the distinguished English author, visited this country recently, he was taken at night to view New York's Times Square. When asked if he did not think it a beautiful sight, he replied that he would think it beautiful if he could not read.

The outdoor advertising promoter is a modern Dædalus, "a most ingenious but execrable artist." Dædalus, you will recall, is a character in Greek mythology who was always converting mechanical skill, industry, and the arts to ill uses.

Legal attempts to regulate, in some instances to banish billboards from the horizon, have met with small success in the face of a united opposition from outdoor advertising companies. To be sure, some states levy taxes, issue permits, or exercise some form of control over billboards, but all of these measures fall short of a solution of the problem.



SHADES AND SHADOWS

Courtesy Movie Makers

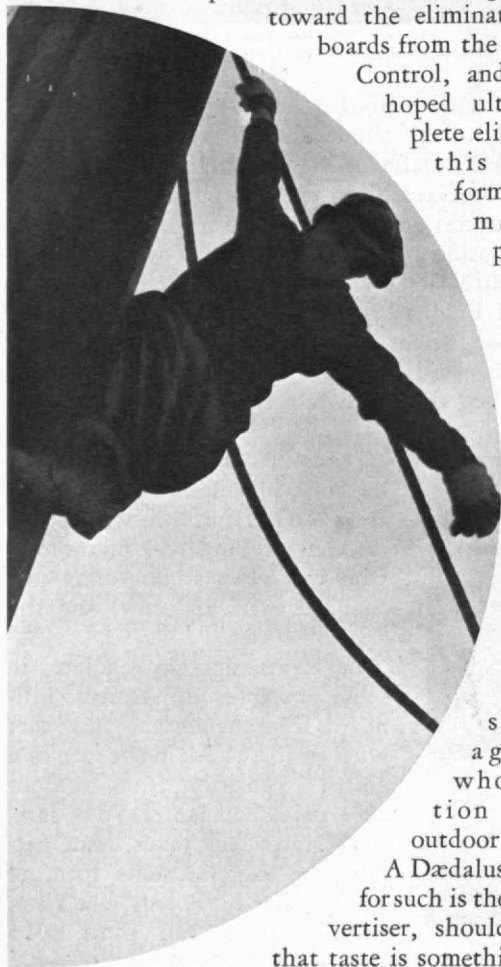
The great outdoor advertising companies are not the only offenders, for with the development of the offensive type roadside stand, the last resort of the hard driven farmer and more particularly of the provincial ne'er-do-well, the countryside has suffered from a plague of small signs erected on fence posts, on the trees, and rocks. They cry the merits of ham and eggs, hot dogs, and ice cold drinks. This renaissance of rural publicity is hideous compared with the humble legends of the general store-keeper of half a century ago.

James W. Martin, Director of the Bureau of Business Research of the University of Kentucky, recently made a survey to determine what states levied taxes and fees on billboards. He found that 15 states have an excise tax on billboards, while seven others specifically authorize cities to impose such taxes. Alabama, Connecticut, Florida, Georgia, Kentucky, Massachusetts, Mississippi, Missouri, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Tennessee, and Vermont are the states which impose billboard taxes; while California, Illinois, Iowa, Kansas, Pennsylvania, Texas, and Wisconsin authorize their cities to levy such taxes. In Connecticut and Massachusetts, for example, the levy is charged definitely as a highway privilege tax. Mr. Martin found that the taxation on billboard advertising is of little consequence from a revenue producing standpoint. Its purpose is to control or in a measure regulate the size and in some instances the location of advertisements.

Observation would indicate, however, that taxation or permit fees has accomplished little toward the elimination of billboards from the countryside.

Control, and it is to be hoped ultimate complete elimination, of this obnoxious form of publicity may be expected to come, not through legislation, but as a result of the power of public opinion. And the force of that opinion is indicated by a growing resentment against the whole conception of modern outdoor advertising.

A Dædalus-like genius, for such is the outdoor advertiser, should be taught that taste is something.



Suburbs of Hell

FROM England comes news that the annual cost of Britain's soot-fall nuisance (cause for official anxiety since the days of the first Edward) has been determined to be \$4,000,000,000. Edward, in 1306, forbade the use of coal in London, an edict which became eased by the time of Elizabeth, though she, by Royal Proclamation, would not allow it to be burned during the periods when Parliament was sitting. The conditions of a few years later were described in the "Diary" of John Evelyn, one of the promoters for the scheme of the Royal Society who, in the King's Charter of 1662, was nominated a member of its directing council. Evelyn's contention in the opinion of many Londoners is as pertinent now as when he complained over 250 years ago of "the hellish cloud of sea-borne coal which maketh the city of London resemble the suburbs of hell."

From these latest observations of Britain's soot-fall, Arnold Marsh, general secretary of the English Smoke Abatement Society, derives an estimate that the annual per capita cost is 35s. While the large cities naturally exceed the average for the entire country, London shows up rather well with a per capita of 39s. Glasgow is rated at 47s., Birmingham at 52s., and Liverpool at 77s. Expressed in another way, laundry in Manchester costs \$1,200,000 more per year than it would if its air were as clean as that of Harrogate.

These figures, of course, do not take into account the unfortunate effects on the health of the inhabitants from breathing the polluted air and from the cutting off of solar energy. Nor do they appear to consider the fuel savings which could be secured if more efficient combustion methods were to be adopted generally.

Turning to the situation in the United States, Pittsburgh naturally comes to mind as the classic example. There the yearly cost of grime per man, woman, and child has been reckoned at \$20. However, Chicago, where the Fuels Division of the American Society of Mechanical Engineers and the Midwest Power Conference held a combined meeting some weeks since, is no backward town when judged by its baneful murkiness. On one square mile of its territory soot is said to account for a deposit of 460 tons per annum.

Under such auspices, although only one session of the joint conference had a single phase of the atmospheric pollution problem as a scheduled topic, the discussion at practically every other session referred to it.

The present approach to the problem of atmospheric pollution arising from mechanical sources, largely determined perhaps by convenience, is to subdivide it three ways: (1) products of combustion from domestic heating plants; (2) fly ash discharge from the use of pulverized coal; and (3) all other dust and fume discharge.

Of the first it is acknowledged that some progress is being made to educate the public in better firing methods, but smokeless fuel seems to be the only really practical remedy. This source of atmospheric impurity is undoubtedly a major sub-division though industrialists have magnified it through an anxiety to unload part of their guilt on the residence dwellers. Fly ash discharge is important enough to be given separate classification because of the large number of power plants utilizing

pulverized coal. It is fair though to assume that in these about four-fifths of the ash goes up the stack in extremely divided form. Actual tests show that 90% of the discharge will pass through a 325 mesh screen. Electrical precipitators collect from 85 to 90% of the solids and are the most widely used device in central station work. Fabric filters show a higher efficiency (up to 98%) but they require more floor space. (For this information we are indebted to Edward H. de Coningh, '25, of the "Dust Recovering and Conveying Company.")

As to the third grouping, various kinds of equipment are on the market for the recovery of the multitude of dust and fume discharges from industrial sources. Fabric collectors find widest application especially where their adoption is accompanied by the retention of valuable materials otherwise wasted. Industries where grinding is a part of the process have installed them readily, and in metallurgical operations their power to save valuable by-product materials has convincingly proved their economic possibilities. Smelter fume, for instance, is not only an unhealthy nuisance as fee dust, but as recovered non-ferrous metallic oxides it offers tangible value.

Producing Steam with Diesel Engine Exhaust

THE use of the explosive engine in stationary power plants is becoming common practice in those sections of the United States where fuel oil and natural gas are the cheapest available fuel. There are many installations

of this character in electric lighting plants, particularly in the oil-producing States. But there are other industries where there is the added requirement of steam for heating and processing; and in some of these plants, a steam boiler is provided with separate firing.

In marine Diesel installations, steam is required for the operation of auxiliaries for heating, and hot water supply; good economy is attained in such cases by making provision for utilizing the heat in the engine exhaust to heat a waste heat boiler. These boilers as designed are made up of

multi-tube units, which are arranged either vertically or horizontally. The hot water from the engine jacket is used as feed water. By the use of such a boiler, the final temperature of the exhaust gases may be reduced to about 350° F., which is high enough to prevent the corrosion of exit pipes and stacks by the acids formed from the sulphur which is a usual constituent of fuel oil. Auxiliary oil burners are installed under the boiler for direct firing; these can be adjusted or shut down entirely, according to the steam demand and the amount which can be generated from the exhaust gases. These burners can be operated when the engine is not running at normal speed, as in a fog, or when, as in port or at anchor, it is shut down entirely.

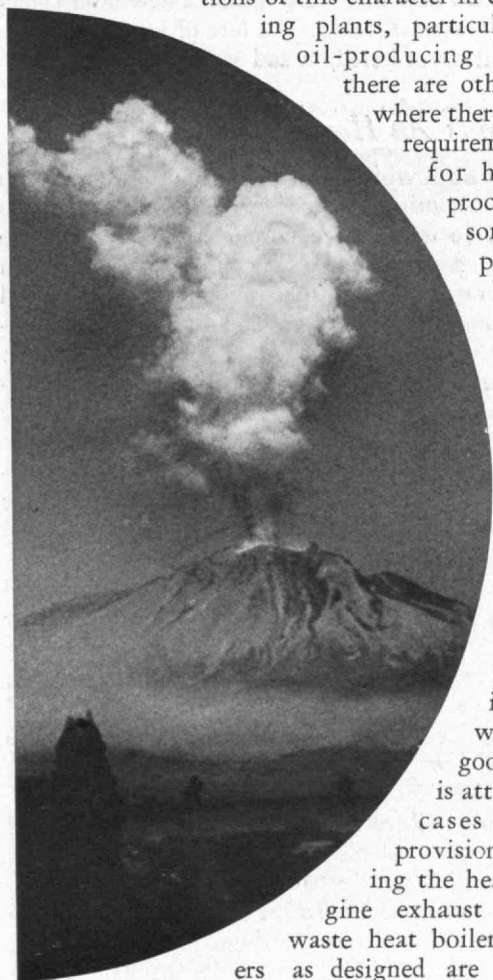
A great advantage of the combination of Diesel engine and waste heat boiler is the high overall efficiency which can be attained. The engine, when running at normal speed, may show a thermal efficiency of perhaps 35 to 40% with a temperature of 500° to 750° F. in the exhaust gases, corresponding to 25 to 40% of the total heat in the original oil, depending on the type of engine, the speed of revolution, and the power output. The waste heat boiler may utilize about 60% of the heat in the exhaust, or 15 to 25% of that in the original fuel oil, the exit gases being reduced in temperature to 350° F., as specified above. This compares quite favorably with the performance of a condensing steam turbine power plant, including the use of the exhaust steam for heating or process work.

Stationary installations on land, using explosive engines with natural gas or fuel oil firing, where steam is needed for heating and process work, may well consider the use of this combination of explosive engine and waste heat boiler. Lighting plants with this installation may utilize their off-peak power by selling steam for day-time operations. Burners for direct firing should be installed where steam is needed when the engine is idle.

Where Ignorance is Not Bliss

IN THE March, 1931, issue of *Vanity Fair*, Julian Huxley (son of Thomas Huxley and author of "The Science of Life") has written on "What Science Doesn't Know," an article that is unique in its humble attitude on the accomplishments of science and worthy of the attention of the scientifically minded. It stands in marked contrast to the statements of those scientists who claim with Berthelot that "the world is today without mystery," Few there are to deny that Science tends "to clarify and to understand all things, to give them a reasonable and positive explanation," and above all to banish the "notion of the miraculous and supernatural," but the emphasis in these remarks belongs on the tendency rather than the actual realization. Regarded in the light of Berthelot, the processes of life are like the tricks of the magician; once discovered, the miracle is forgotten — the miraculous becomes unmiraculous.

It is more important to be conscious of our abounding ignorance if only that we may be distinguished from our ancestors, on whose queer ignorances we, in our sophistication, delight to dwell. Without this distinction we are but as they though we smile ever so good naturedly at past absurdities of science. No one dreamed of the possibilities of electricity — that the mariner's compass, the





FURNITURE IN THE MODERN MODE, DESIGNED BY PAUL T. FRANKL. NOTE THE USE OF SYNTHETIC PLASTICS AND THE NEW ALLOYS

Bakelite Corporation

electric cell, and lightning were all manifestations of this same electricity, to mention but one of many instances in the past.

Our greatest accomplishment has been to assemble many necessary tools for enlarging our field of knowledge. And the imaginative scientist finds a sense of exhilaration in this standing at the stairway of increased knowledge, the first step of which is the recognition of ignorance.

The specific points about which we are ignorant mentioned in Mr. Huxley's article range from whether or not the sea-serpent actually exists to the philosophic and psychological implications of growth, decay, and the development of the Mind. We do not know how to apply practicably the theories we have developed. An example of this is found in the recent glandular discoveries for which we have evolved many able theories, yet the possibility of applying these to correcting the maladjustments of human living is yet unrealized. The same is true of drugs, sex, and heredity. We have learned enough to have a tantalizing vision of man controlling Nature and Destiny to suit his desires, yet the fulfillment of this vision is beyond our present reach.

Science has scratched many surfaces, revealed many dark places, and cured many ills, but remains ignorant on one of the most important phases of biology — the nature of Mind, the relation of Mind to Matter, and its relation to the universe — all this field for research is practically untouched because its intangibility eludes scientific method, continues Mr. Huxley.

This leads to the development of new methods that will reveal subtleties — a method capable of measuring Mind. The field of discoveries then open to man's vision are limitless. He can build up new philosophies, new religions, and a new science more in accord with the era of the superman. We may be able not only to prove the existence of many things about which we have theorized,

but learn to use that which we have to our greatest good. We can, to use his example, not only prove the existence of telepathy, but by controlling it obtain a weapon more valuable than sentimentality and propaganda. Brains, he claims, may not be the only machines capable of generating "high-tension mind" just as batteries are not the only way of obtaining a respectable electric potential. He continues this line of thought to the time when we may disclose that this "intensive mind" can control matter; may produce "mind-rays" able to make matter turn itself into any form to accord with the ideas in the mind, somewhat after the manner of wireless waves in radio broadcasting.

It is all an interesting matter of speculation, and presents a challenge to science. "The Earth as a mere globe is losing its unexplored secrets and each new discovery means a new adjustment of ideas and practical living. The lure of ignorance leads to the prevention of boredom and stagnation."

90,000 Words An Hour

TWO inventions which claim a tremendous increase in speed in transmitting intelligence have recently been announced. One is a device which transmits facsimile messages at a rate of 90,000 words an hour, a fact which was demonstrated by the International Telephone and Telegraph Company of London. The other is a mechanical-radio-typewriter apparatus developed by Glen W. Watson of Detroit, who claims his instrument can transmit typewritten words by radio at the rate of 1,200 letters per minute.

The instrument announced by the International Telephone and Telegraph Company passes a typewritten or printed page under a scanning beam, and the image is recorded on sensitized paper in the receiving machine. With this device facsimile messages can be transmitted by radio, and telegraph and telephone land wires, but it is not practicable for overseas cables. It reproduces only in black and white and cannot be used for halftones. G. H. Nash, executive vice-president of the International Telephone and Telegraph Company, announced that an improved model which is soon to be put into operation will transmit 180,000 words an hour.

The invention of Mr. Watson, which has been termed a radio-typewriter, employs two identical revolving contact arms which are electrically driven and synchronized. These contact arms revolve against insulated segments each of which corresponds to a letter on the keyboard of the transmitting typewriter mechanism.

Contacts with the various alphabetical segments transmit short wave radio impulses which, when picked up by the receiving apparatus, are made to operate the corresponding letter segments on the receiving typewriter.

Although Mr. Watson's device may embody new principles, this is not the first time that typewritten words have been transmitted by radio. Telegraph-printers, over which approximately 90% of the news of the country is transmitted to the newspapers by press associations, operate over a land wire system, but these machines can also be used for transmitting the typed word by radio.

The telegraph-printers used in the transmission of news are usually operated at a speed of from 60 to 70 words a minute. Where transmission speed is limited by the ability of an operator to prepare copy for transmission, such as the perforation of a transmission tape for the telegraph-printer machines, speed of transmission has its limits. Devices, some of which are already in use, for the transmission of the printed page, drawings, and photographs, may ultimately come into general use for the transmission of intelligence.

It is quite probable that within a few years the press associations will deliver news in complete, instantly transmitted pages instead of the individually typed word, and that methods of governments and commerce will be revolutionized by this swift means of exchanging facsimile reproductions of documents of state, and business and legal papers.

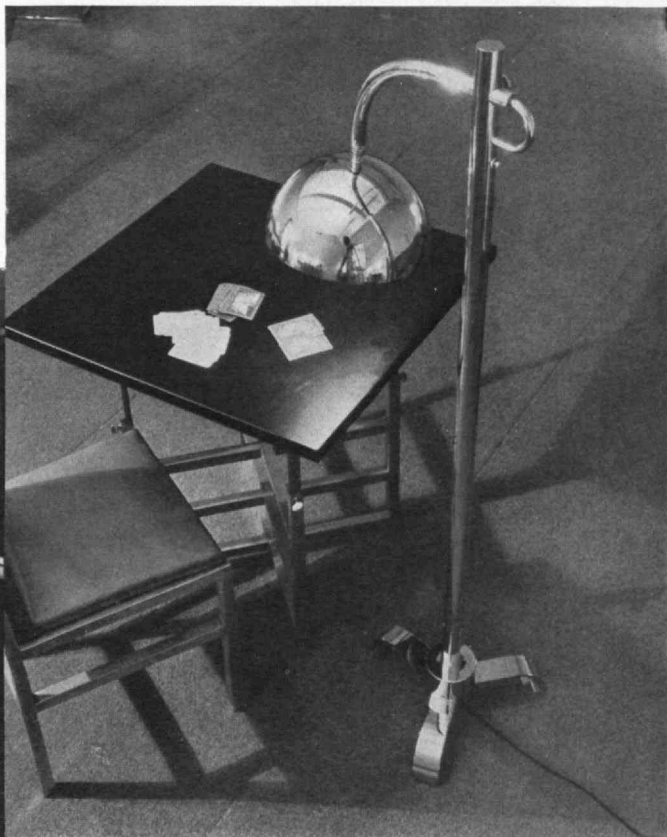
Imminent Airships

IT IS rarely that any engineering or technical development has ever been so bludgeoned by chance as has the development of airships. Disasters and discouragements

have to date so offset spectacular achievement that in three out of five of the leading aeronautical nations of the world real activity in lighter-than-air work is simply non-existent. Yet such is the faith of certain leaders and classes of technical personnel in the other two countries that we seem on the threshold of greater achievements in this field than was ever considered possible before.

France, the birthplace and leader of all lighter-than-air activity from 1783 until the opening of the Twentieth Century, has contributed little since the loss of the *Dixmude* in 1921, save a few ships of the blimp type. Italy, which led the world in the medium sized semi-rigid type, has, since the Nobile debacle in the Arctic, abandoned all activity.

England, which has built more rigids than any other country except Germany, sits back stunned by the blow of the *R-101* disaster. Only recently has the Board of Assessors under the chairmanship of Sir John Simon, completed its hearings on that accident. The direct cause of it was attributed to a substantial loss of gas from one of the forward cells caused by the gale which ripped the forepart of the outer envelope. No evidence of unsound structure or control was found and no fault in navigation discovered. However, there was considerable reproach, or at least regret, over the fact that the ship



Bakelite Corporation

ABOVE: TYPICAL OF THE WORK OF MODERN ARTISTS WHO BELIEVE IN FUNCTIONAL DESIGN — THERE IS NOTHING ON EITHER TABLE OR LAMP THAT DOES NOT PERFORM A FUNCTION. DESIGNED BY DONALD DESKEY

LEFT: LOUNGING CHAIR WITH LAMINATED RESINOID COVERING FRONT RAIL. THE SIDES AND BACK ARE OF LACQUERED WOOD EDGED WITH CHROMIUM PLATED STEEL. THE TABLE HAS A FORMICA TOP AND CHROMIUM PLATED LEGS. DESIGNED BY G. ROHDE

had been forced into a premature departure for reasons of public policy. Although the Air Ministry has not yet made such an announcement in so many words, the entire British airship program seems dead or dormant for a number of years. Even were the remaining *R-100* inflated with helium, its shifting power would be so critically affected as to very much limit its performance; and further flight with hydrogen would be much resisted.

So different are the reports from Germany and the United States that it is difficult to believe the same subject is being discussed. The launching of the *City of Akron* or the *ZRS-4* as it is designated, is practically assured for late in June or early in July. As is commonly known, it will be of 6,500,000 cubic feet capacity, by far the largest ever launched, and will, in addition to many other advanced yet well-tested features, be equipped with five full-sized scouting and fighting airplanes. It is the first of two being built for the United States Navy by the Goodyear Zeppelin Company of which Paul W. Litchfield, '96, has been the organizer and moving spirit. Meanwhile, in Germany the *LZ-129* has been announced for launching in the spring of 1933 and will be of 700,000,000 cubic feet capacity and, in addition to being helium inflated like the American ships, will be powered with Diesel engines. Provision will be made for 50 passengers, a crew of 35, and ten tons of mail.

Even more significant than the building programs, or at least tied up intimately with them, are the advanced plans for trans-oceanic airship lines both across the North Atlantic and from our own Pacific coast to Hawaii and the Far East. It was early realized that the North Atlantic route would be an international proposition. Germany was a potential competitor and England not beyond the grounds of future development. With European labor costs and operating expenses at a considerably lower level than those which must exist for the American inter-

ests, such competition would be as difficult to meet as is the equivalent competition in ocean-going surface navigation. On the other hand, the United States has a practical monopoly on the world's helium supply. Since the holocaust of the *R-101* even the former hydrogen enthusiasts in the German camp have realized that helium must be the *sine qua non* of any airship passenger transportation. Therefore, the Goodyear Zeppelin interests early established the International Zeppelin Corporation to coöperate with European interests and to urge a bill through Congress known at the last session as the MacNary-Parker Bill which would provide protective legislation for such coöperation. This would enable the Postmaster General to contract with such a trans-oceanic airship line for the carriage of mail. Meanwhile the Pacific Zeppelin Corporation was formed on the Pacific coast for similar purposes of study and organization toward the west, yet in this case for a purely American proposition. Both companies have received great coöperation from important financial firms and from groups already engaged in other forms of transportation.

Unfortunately, pressure of other legislation prevented any action on the MacNary-Parker Bill at the last session of Congress, but the considerable reaction to it seemed generally favorable. It will, of course, be introduced and presented at the next Congress. Says Paul W. Litchfield, President of the Goodyear Zeppelin Company, "If the bill is passed, America will have ready its first commercial ship in 1934 to initiate a weekly trans-Atlantic service in coöperation with the *LZ-129*." If mail contracts can be secured on anywhere near as favorable a basis as the present contract given to airplane lines, passenger fares will be in the neighborhood of \$800 for a crossing from terminal to terminal, of about 48 hours from west to east and 70 hours for the return journey.



FAT STEEL RODS PULLED BY MAN AND MACHINE INTO MILES OF ANTENNA-LIKE WIRE. PHOTOGRAPHED AT THE PLANT OF THE COLORADO FUEL AND IRON COMPANY

Eugene Hutchinson



BOOKS



Scientific Book Club Selections

BY special arrangement with the Scientific Book Club, Inc., *The Review* is to present each month a list of books selected by that body as meriting the careful attention of all who desire to keep abreast of scientific thought. The selections are made by an editorial committee consisting of Arthur H. Compton, Edwin G. Conklin, Kirtley F. Mather, Harlan T. Stetson, and Edward L. Thorndike.

For April the principal selection was:

THE PHYSICAL BASIS OF PERSONALITY, by Charles R. Stockard. \$3.50. 320 pages. Illustrated. New York: *The Scientific Book Club, Inc.*

"Most people think of personality as the mental rather than the physical personality. Therefore the title of this book may be somewhat misleading. There is almost nothing about the mental features of personality; it deals primarily with the material factors, whether inherited or environmental, in the development of human and animal bodies. These it treats in a thoroughly scientific and scholarly fashion. Therefore it is a most valuable book for those who would understand the many remarkable advances of recent years in the fields of experimental genetics and growth processes."

Other highly recommended books obtainable from the S. B. C. are:

TAMING THE CRIMINAL: ADVENTURES OF PENOLOGY, by John L. Gillin. \$3.50. 318 pages. Illustrated.

"In this book we have an important volume which will appeal not only to the professional sociologist but to every person concerned with the welfare of his fellow-men. It is a result of a study by Dr. Gillin, who, with the aid of the Social Science Research Council, spent a year in Japan, the Philippines, India, Switzerland, Belgium, and England, searching for better methods in dealing with our large criminal population. While each country has its own particular problems, it also makes constructive contributions to the science of penology as a whole, which might well be adopted in the United States, where the treatment of prisoners is tradition-bound to an unusual degree, particularly in the northern states."

THE REALM OF THE AIR, by Charles Fitzhugh Talman. \$4.00. 307 pages. Illustrated.

"There appears in several newspapers of this country a daily paragraph entitled (Why the Weather), which contains significant scientific information framed in quite non-technical language. The author of this paragraph is a well-known meteorologist of the United States Weather Bureau, who for many years has been custodian of that bureau's exhaustive collection of literature. From his articles written for magazines and newspapers, he has prepared this book, teeming with information presented in an informal and almost colloquial manner, altogether delightful to read."

PROBLEMS OF EVOLUTION, by Professor A. W. Lindsey. \$2.75. 236 pages.

"Of the making of books on evolution there is no end, and much reading of them is a weariness to the flesh. Nevertheless, it may be a stimulus to the mind and a guide to future research. Such is the case with this book by one who is thoroughly acquainted with all the more important contributions to the facts and factors of evolution, is broadminded enough to recognize the value of Lamarckism, Darwinism, and mutation, and bold enough to attempt to combine in an electric theory many features of these apparently conflicting concepts. . . ."

ARCHEOLOGY OF THE ARKANSAS RIVER VALLEY, by Warren K. Moorehead. \$4.00. 204 pages. Illustrated.

"This latest contribution to American archeology from the director of the Department of Archeology in Phillip's Academy at Andover, is in no sense a complete treatise upon the aboriginal occupation of this significant region. Rather is it his purpose to indicate the importance of this large and almost unknown field and to suggest future and thorough exploration. To accomplish this, he describes in detail, and with a wealth of excellent illustrations, the Indian sites and artifacts which thus far have come to the attention of trained observers."

SCIENCE AND FIRST PRINCIPLES, by Filmer S. C. Northrop. \$3.00. 315 pages.

"In a book of more than passing value, Professor Northrop, a member of the Department of Philosophy at Yale University, has undertaken the extraordinarily ambitious program of investigating the philosophical implications of the whole range of science and of interpreting these in the light of certain guiding principles which he feels are required by the logic of the present state of science. Although the book is intended for the layman, the technical scientist, and the professional philosopher, it will prove rather heavy reading for all three groups. The wide range of sciences and the details considered, make the book difficult for the philosopher; the many rather intricate philosophical principles raised are not easily apprehended by the scientist. To the layman, both of these difficulties will be present. However, the book is of real interest from the standpoint of the educated reader who is seeking for a unified view of nature."

ANCIENT CIVILIZATIONS OF THE ANDES, by Philip A. Means. \$7.50. 586 pages. Illustrated.

" . . . Thoroughly scholarly in its breadth of view and its wealth of detail, it is written in the friendly language of everyday speech, and will appeal to the interested layman just as strongly as to the professional student. Mr. Means has profited well by the long series of journeys in Ecuador, Peru and Bolivia, which he has been fortunate enough to make. To the information thus gained at first hand, he has added the results of long and painstaking review of the voluminous literature pertaining to his chosen field of study."

11,000 TONS

Moving an Eight-Story Telephone

BY WILLIAM

See

CAN our main office building be moved and turned 90° with safety, and without disturbing long distance, local telephone and house services? This question was presented to engineers by the Indiana Bell Telephone Company at Indianapolis, Indiana. Their main office building, an eight-story structure with column loads totaling almost exactly 11,000 tons, was located at the southwest corner of Meridian and New York Streets. The Telephone Company owned a plot approximately 200 feet square on which, in addition to the main office, was a smaller building used for local telephone service that could not be disturbed. All other structures on the property could be and were wrecked. A new building was planned which would satisfy the Company's needs and which was to be designed for a future extension both vertically and horizontally. The two service buildings, however, were in diagonally opposite corners of the lot, thereby leaving an S-shaped area for the development of the new building. A structure on this shaped area would not only be uneconomical and inefficient but also aesthetically an improper development opposite a park on the Fifth Avenue of Indianapolis. Thus it was that the above question was asked and, to the credit of engineering ingenuity, answered affirmatively.

Safety and service were the primary considerations, as the trans-continental cables of the telephone system go through this building, and these, of course, must at all times be maintained. Also the telephone service required the presence, within the building, of approximately 1,000 persons day and night, seven days in the week, and about four million dollars' worth of equipment. The house services, such as steam, water, gas, sewerage, elevator, and so on, were also to be maintained. The fire hazard was another serious problem which presented itself, as moving operations usually require extensive use of timber blocking and cribbing.

The building is of structural steel frame, terra-cotta arch, and brick wall construction, and measures approximately 101 feet by 135 feet with a court area above the first floor, being U-shaped. The footings at four tons per square foot rested on a very uniform grade of coarse sand. The heaviest individual column load was approximately 250 tons.

The preliminary operations involved the excavating of the plot to approximately two feet below the existing basement floor, wrecking existing basement walls of the building, driving steel sheeting along the streets, dismantling the basement partitions and equipment, providing temporary telephone and house service connections, underpinning the small building at the southwest corner of the lot, constructing column footings for the building's new location, lifting the columns preparatory to moving, and preparing the rolling surface.

The telephone cables entering the building were spliced out so as to give ample play during the move. The house services such as steam, water, gas, and sewer were maintained by means of Y-connections with valves and flexible jointed pipes or hose. These were spliced out or shortened as required. The elevator pits were reconstructed of a structural steel frame hung from the first floor framing and enclosed with corrugated sheet metal. On the subgrade of the lot a 6-inch reinforced concrete mat was placed, the surface of which was screeded level. On this mat 6 by 8-inch timber ties, 16-inch centers,



TOP TO BOTTOM: 1. BUILDING IN ORIGINAL POSITION, SHOWING RELATION TO OTHER BUILDINGS. 2. READY FOR JOURNEY TOWARD SOUTH. NOTE RADIAL GUIDE LINES ON RAILS AND SPLICED-OUT TELEPHONE CABLES. 3. END OF FIRST MOVE. 4. TURNED 30°. 5. STRUCTURAL STEEL FRAME

ON WHEELS

Building Without Interrupting Service

H. MUESER

Page 370

and 90-pound railroad rails at 9-inch centers were placed. These were to act as temporary grillages and distribute the building load to the sand below, at about one ton per square foot. The columns were then progressively lifted between $\frac{1}{8}$ inch and $\frac{1}{4}$ inch by means of brackets riveted to the columns, needle beams and four 100 ton jacks, and set on distributing beams, four roller shoes, and rollers.

The rollers were 3-inch cold rolled shafting, eight under each shoe, and rested directly on the rails. The needle beams and the beams distributing the column load to the roller plates were spliced to their respective beams under the adjacent columns. This structural frame was then stiffened with a set of diagonal steel members in each bay. Upon the completion of this structural frame, the building's columns were rigidly held in position, the load was on the rollers, the fire hazard had been reduced to a minimum, and the building was ready to start its journey.

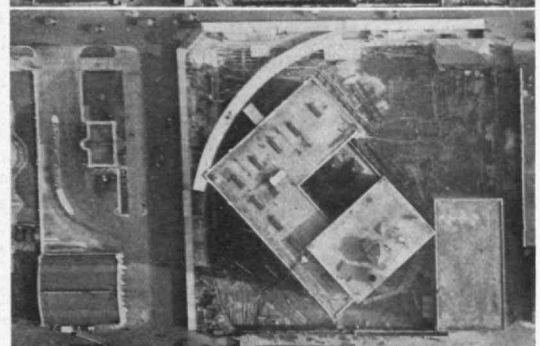
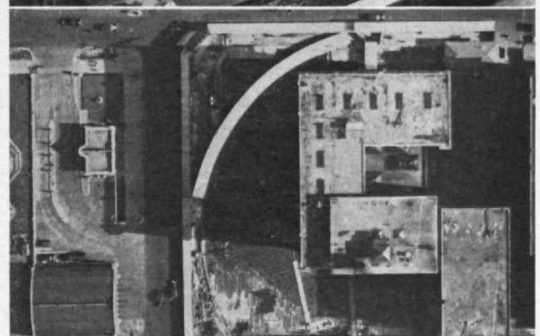
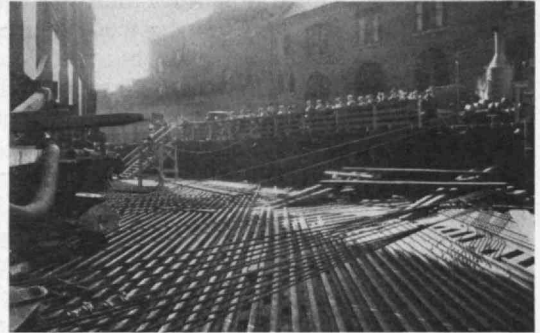
The building was first moved in a southerly direction about 52 feet, after which the shoes and rollers were reset, and then turned about a pivot point located within its own area. Upon the completion of this operation the building was in its final location. The northwest corner of the building, which was furthest from the pivot point, traveled about 224 feet in making the turn; this corner moving a total distance of 276 feet. The pivot point moved only the initial 52 feet, so that the path of each column varied between these limits.

The first move was made through the use of 18 screw jacks of 100 tons capacity, each exerting a total pressure of approximately 200 tons. The reaction for the jacks was obtained through bracing against the existing vault walls and sheet piling. The first move was completed in about four days, working a single shift and averaging 13 feet a day.

One man operated each jack by moving its handle from a vertical to a horizontal position. Upon a given signal from the foreman, all jacks were operated in unison, each man making six strokes on the jack, keeping it tight at all times. A one minute rest followed each six stroke period. With each stroke the building moved $\frac{1}{16}$ inch, and thus the operation was continued until the throw (12 inches) of the jack had been reached. The jacks were then compressed and reset, and the operation repeated until the move was completed.

When the building reached its most southerly point, each column was again lifted and the shoes and rollers were reset. Previously the pivot point had been marked and radial lines from it had been painted on the rails, these acting as a guide for the setting of the rollers during the swing. The building was then again moved in a similar manner to that described above, except that only nine jacks were used with the help of a "donkey engine" exerting a pull through two sets of six-part sheave blocks and $\frac{3}{4}$ -inch steel cable at the northwest corner of the building. The pull was 60 to 70 tons in each set of blocks. The course of the building was carefully watched both as to level and position during the turn, the latter being easily controlled by cutting the rollers under the individual roller shoes more or less as required. The resetting of the rollers took about a week and the circular swing took about 14 days.

When the building had reached its final location, the columns were again lifted, the rails and timber ties immediately under the columns removed, and the column base attached (*Concluded on page 428*)



TOP TO BOTTOM: 1. TURNED 60°. NOTE LOCATION OF JACKS. 2. GENERAL VIEW OF PULLING ARRANGEMENT. 3. FINAL POSITION — VIEW SHOWS SIDEWALK BRIDGE. 4. AERIAL VIEW AT END OF FIRST MOVE. 5. DURING OPERATION CLEARANCE BETWEEN TWO BUILDINGS WAS 2 $\frac{1}{2}$ INCHES



Open House: 1931

EIGHT years ago the Institute opened its doors for general public inspection on its first Open House Day. A comparatively small group of Alumni and a handful of the public attended. From that small beginning, Open House, which is the work of the students' Combined Professional Societies, has become one of the most valuable and interesting of Institute affairs. Last year, Open House Day was reserved for those who attended the All-Technology Reunion. This year, on Saturday, May 2, Technology will again open its doors to the public for a great scientific and engineering exhibition. In 1929 more than 20,000 persons attended Open House, and at least that number is expected this month.

The Combined Professional Societies, which is composed of the student chapters of the various national professional societies, is arranging a program of exhibits and spectacular features which are expected to make this year's Open House more comprehensive and interesting than ever before. A Faculty committee appointed by President Compton is cooperating with the student leaders in arranging the program.

As May 2 is the day of the triangular crew race between Princeton, Harvard, and the Institute oarsmen, this much anticipated event will take its place as one of the interesting features of the day. Every Department is to arrange special exhibits or experiments, and the various student activities are planning features which will illustrate the important part they play in the life of the Institute. In addition to many spectacular experiments, including a hook-up of every modern method of communication, the Department of Electrical Engineering will pay its tribute to the memory of Michael Faraday with a special exhibition of such electrical apparatus as Faraday employed in his early experiments. This year is the one-hundredth anniversary of Faraday's discovery of electromagnetic induc-

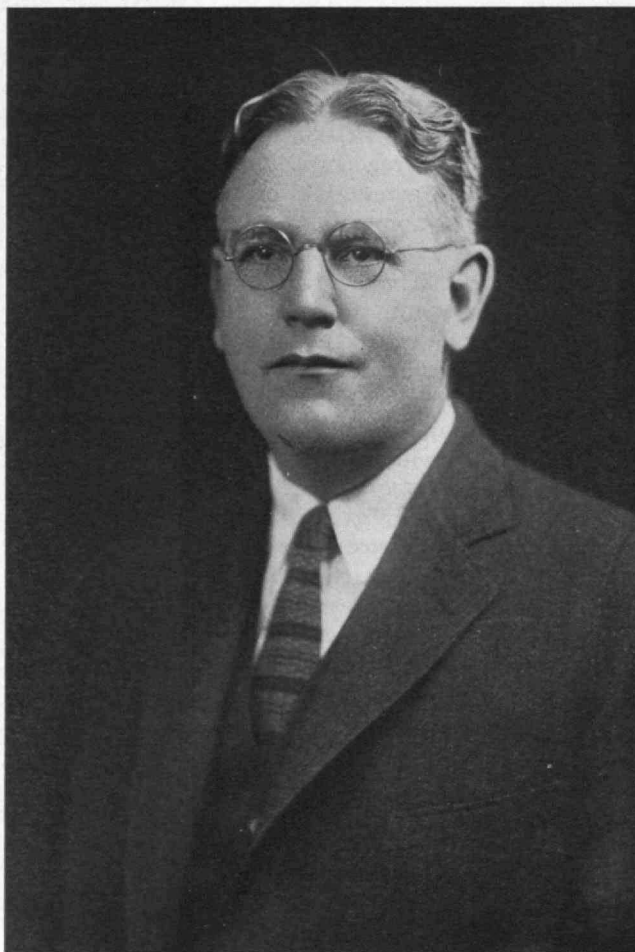
tion. Recent developments in science and engineering will be demonstrated by special exhibits in the Departments of Chemistry and Chemical, Aeronautical, Civil, Mechanical, and Mining Engineering, as well as the Department of Biology and Public Health. The Department of Physics is already working on apparatus for its exhibits and experiments, and the Department of Building Construction is arranging exhibits to illustrate the latest methods in building construction.

The 151st Council Meeting

IT IS an old Technology custom that the Faculty Club meet with the Alumni Council once each year. It is also a custom that for these joint meetings the program, save for the few necessary business items on the part of the Association, be planned and presented by the Faculty Club. Both of these customs were observed on the evening of March 23 at Walker Memorial when the two bodies met to hear a discussion on comprehensive examinations.

Donald G. Robbins, '07, Vice-President of the Association, presided over the meeting during the business session. At his call the Secretary presented the report of his activities, together with a summary of the reports presented to the Executive Committee by the Treasurer of the Association and the Publisher of *The Review*. Preceding these reports Chairman Robbins called on Charles E. Merrell, '88, guest of the Council from Cincinnati, to present greetings to the Council and Faculty Club from his home town.

Vice-President Robbins then turned over the meeting to Professor Dean Peabody, Jr., '10, President *pro tem.* of the Faculty Club, who introduced Dean Clifford H. Moore of Harvard and Professor Leon B. Richardson of Dartmouth. Each of these speakers spoke at length on the subject of Comprehensive Examinations, giving their experiences in their respective colleges. Dean



Bachrach

BRADLEY DEWEY, '09, WHO HAS BEEN NOMINATED TO THE PRESIDENCY OF THE ALUMNI ASSOCIATION FOR 1931-1932. SINCE ONLY ONE CANDIDATE IS NOMINATED, NOMINATION IS EQUIVALENT TO ELECTION. MR. DEWEY IS PRESIDENT OF THE DEWEY AND ALMY CHEMICAL COMPANY, CAMBRIDGE, MASS.

Moore said that the system was inaugurated at Harvard in 1916, to date over 5,000 examinations had been held, and the failures amounted to 8.5%. The results are felt to be very satisfactory, in that such examinations tend to round out and correlate the students' knowledge.

Professor Richardson stated that their Dartmouth experience had been over a period of only two years, but that they were optimistic over the scheme. One interesting point which he brought out was that this is nothing new, as comprehensive examinations were a regular thing at Dartmouth over the period from 1828 to 1875.

Following the two addresses Chairman Peabody called upon Professors Jackson, Millard, and Prescott to comment briefly on the subject. Professor Millard confessed that in the Chemical Department on the next day they were trying, with some fear and trembling, an initial comprehensive examination. General discussion followed, and finally Dr. Compton closed the meeting by stating that in his opinion all who were present were much impressed, like himself, with the possibilities of holding comprehensive examinations.

Ninety-seven members of the Alumni Council and Faculty Club were present.

Corporation Visiting Committee Reports

ONE of the administrative policies of the Institute in recent years has been to give the different departments of the Institute an opportunity to obtain advice and coöperation from leaders in the industries for which the departments train students. Accordingly, there have been created the Advisory Committees that meet with Faculty members of the departments to discuss educational and industrial needs.

To supplement this system of Advisory Committees, there are also Visiting Committees composed of members of the Corporation. These committees contribute much to the better understanding between the Corporation, the Faculty, and the industrial world. The Corporation, wishing to publish and emphasize the reports and transactions of the work of these committees, has asked that they be presented in The Review. Many have been published in the past years and to these are added two more, presented below, covering (1) the Department of Architecture and (2) the Departments of German, Romance Languages, and English.

REPORT ON JOINT MEETING OF THE VISITING AND ADVISORY COMMITTEES OF THE DEPARTMENT OF ARCHITECTURE*

AT A called joint meeting of the Visiting and Advisory Committees of the Department of Architecture a careful analysis of the status of the Department resulted in the adoption of the following decisions and recommendations to the Corporation.

Before outlining the Committees' conclusions under the various headings of the agenda, we wish to record our deep appreciation of the splendid gift of Mr. and Mrs.

* The Visiting Committee of this Department consists of: Harry J. Carlson, '92; A. Lawrence Lowell; and A. Farrell Bemis, '93. The Advisory Committee consists of: John C. Bollenbacher, '09; William A. Delano; Frederick W. Garber, '03; Robert D. Kohn; C. Grant Lafarge, '83; William S. Parker; Arthur W. Rice, '91; William J. Sayward, '01; Arthur A. Shurtleff, '94; and Frank R. Walker, '00.

William Emerson for scholarship aid. The funds thus provided, together with monies made available by the Executive Committee, are of incalculable benefit in making possible the education of many who are destined to take leading places in the ranks of our profession who otherwise would be unable to obtain these advantages.

Your Committee also wishes to state that it was deeply impressed by the intimate and personal relationship between the student body and the instructing staff, and by the *esprit de corps* of students and teachers under the sympathetic leadership of Professor Emerson.

Considering first the frequently recurring suggestion from practicing architects that a certain minimum of office practice be made a prerequisite for a degree, it was decided after full discussion that, while highly desirable, and to be advocated along with foreign and domestic travel, it was a requirement which lay outside the Department's jurisdiction and an attempt to enforce it might result in the unwarranted loss of a degree.

The Committee approved in principle the division of students in fourth and fifth year classes on the basis of their scholastic standing, such division to be altered or adjusted each half year. The details to be worked out to suit conditions as they arise.

While the problem is by no means a new one, its increasing importance leads your Committee to strongly advocate sending the teaching staff from Cambridge to the Rogers Building for first, second, and third year courses, rather than recommend the costly alternative of furnishing transportation of the student body to Cambridge. This plan should be made universal except for the teaching of certain subjects in Course IV-A.

A comprehensive review of the history of the Department of Architecture covering the last ten years reveals:

- (1) A constantly mounting enrollment (from 119 in 1919 to 301 in 1929)
- (2) Important changes in the Course Schedule of great benefit to the student
- (3) The supplanting of the four-year course by the five-year requirement, not only without producing adverse comment, but without checking the enrollment
- (4) The following record of achievement by our students in the winning of coveted prizes and scholarships — 2 Paris Prize Winners in three years, Winners for three successive years of the Rotch Scholarship and of the Guy Lowell Scholarship, Winners of the Stedman and Le Brun Scholarships and first holder of the newly established Kelly Scholarship
- (5) Striking improvements in the methods of teaching Design and History and the correlating of Design, Color, and Modeling
- (6) A greatly improved system of relationship between the Library and the Student
- (7) This statement would be incomplete without a tribute to the inestimable value of Professor Carlu's services in Design — he has coached three Paris Prize winners in five years.

Certain difficulties having arisen in the operation of the Honor System, the whole subject was referred to the Student Council. The recommendation of the Council that the Honor System be discontinued was reluctantly concurred in by your Committee.

Your Committee is in complete accord with the desire of the teaching staff to create a more intimate connection between the various subjects and Design itself; to consolidate several of the short courses into a fewer number, and most important of all to foster the teaching of Abstract Design as a fundamental to all instruction in designing.

Your Committee was highly gratified with Professor Lawrence's statements as to the purposes of Course IV-A and the results he is achieving and in particular with the declaration that his main object is to create a sympathetic attitude of the architectural engineer to the problems of the architect, and *not* to create "designers." The Committee recommends that Geology of Materials, which is now taught only in Course IV-A, be included also in Course IV, and that the outline instruction now given in the Mechanical Equipment of Buildings, be retained as of value in a well-rounded comprehension of modern building problems.

After full discussion it was decided that highly specialized training of professional men in either of the Department's courses would be a grave error.

Rather than create a special committee to aid Department heads to secure opportunities for employment in architects' offices, your Committee pledged the coöperation of the profession in responding to every request of Professor Emerson.

Since your Committee is convinced that timely financial aid is of such inestimable value to promising students, and so in turn to the profession, the question arose and is here submitted for your consideration, as to whether any of the Institute's publications, such as the brochure on the Department, could carry a statement of, first, the need; second, the benefits accruing; and third, the designation of the agency (the Chandler Fund) through which gifts and bequests could accomplish the desired purpose.

Respectfully submitted,

JOHN LAWRENCE MAURAN, '89

REPORT OF THE VISITING COMMITTEE OF THE DEPARTMENTS OF GERMAN, ROMANCE LANGUAGES, AND ENGLISH*

In this, the first report of your Committee since the death of James Phinney Munroe, '82, we desire to express our sense of the great service rendered by him as Chairman of this Committee from 1902 to the time of his death. During this period of more than a quarter of a century steady progress was made in giving recognition to the cultural studies in the Institute program, and in integrating them with the rest of the curriculum; at every stage in this progress his sympathetic understanding of problems, through his constant contact with Alumni, students, and members of the Faculty, made his advice and his assistance of the greatest value.

Your Visiting Committee on the Departments of German, Romance Languages and English desires to report that on Monday, January 20, 1930, it held a meeting with the President of the Institute and Professor Pearson, head of the Department of English and History, and has gone over the problems confronting the department with a good deal of thoroughness.

*The Visiting Committee of the Departments of English and Modern Languages now consists of: Pierre S. du Pont, '90; William H. Bovey, '94; W. Cameron Forbes; and Payson Smith.

At the Institute there is no grouping of departments in such a way as to have a single head over English and other languages, and your Committee will beg leave to make a report upon matters relating to other languages at the Institute at a later date.

In 1924 the Visiting Committee made a report in which it recommended a conference of colleges to see if joint action of many colleges could be secured in regard to stimulating an understanding of the importance of the correct use of English and emphasizing the necessity for general action upon it. Although such a conference has not been held there is no question but that the objects sought to be achieved at that conference have been accomplished in an important measure at the Institute of Technology. These objects have been in part: work tending to facilitate public speaking on the part of students; segregating them in small groups not exceeding ten in number, with periodic meetings, at which one addresses the group and then all join in debate; an effort to have the teachers understand the value and importance of speaking and writing good English and to have particularly those in the technical departments impress upon their students the necessity of clear and concise expression and accurate wording of their documents and reports; and means for bringing men who had defective training in the past up to a better understanding of the use of their own language.

Both Dr. Stratton and Professor Pearson were of the opinion that there had been marked progress made in teaching English and in the acquisition of its use by the students of Technology, and your Committee begs to recommend that the President and Faculty adopt as a rule of the Institute that in all courses the policy be established of not accepting written work that is not satisfactory in point of English. When it is clearly understood by both instructors and students that, no matter how great the technical excellence of the paper, if the form of its presentation is bad it will not be accepted, there will result a much to be desired improvement.

The question was asked whether it would be well, in selecting new instructors and in promoting those already on the staff, to give special attention to their knowledge of English and their realization of its importance. President Stratton informed the Committee that this was part of the established policy of the Institute; that it was responsible for a good deal of the progress shown; and that it was proposed to lay continued emphasis upon this necessary consideration.

Your Committee feels that to secure the best results in this Department a moderate increase in the salaries paid to the instructors is important, if not imperative. . . .

Your Committee desires to put on record its belief that mastery of one's own language is self-evident and fundamental and that the importance of such mastery cannot be over-emphasized.

It also wishes to record its approval of the method authorized by the Faculty and in effect for the last ten years of using the cultural instruction in history and in literature given by the Department as the basis for the training in English composition.

Respectfully submitted,

W. CAMERON FORBES

F. W. FABYAN, '93

(Continued on page 426)



He no longer flies alone!



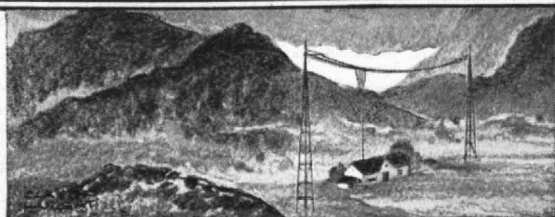
Formerly a man a mile above the earth was shut off more completely than if he were in the heart of Africa or the depths of the frozen north.

Now the Western Electric radio telephone ends that isolation. The flier whose plane is equipped by Western Electric is always in touch with ground stations, and he flies with greater dispatch and greater safety.

This telephone for airplanes grew out of many years' experience in making telephones and other apparatus for the Bell System. It is one more example of Western Electric's skill in the art of voice reproduction.

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DOODLE-BUGS DEPOSED

(Continued from page 378)

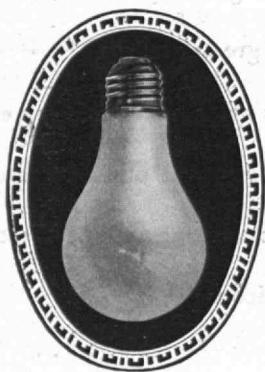
For the location of oil, the magnetometer has been widely used, but not always with uniform success because of the tendency to extend its use to areas better adapted to some other device. The cheapness of the instrument, low cost of operation, and the ease of manipulation make it an attractive means of surveying. Its best field of application is undoubtedly concerned with large, deep-seated mountain ranges of granite or other highly magnetic materials. The low magnetic content of upper sedimentary rocks does not present anomalies of sufficient magnitude to be distinguished from errors of observation. A satisfactory plan would be to use the magnetometer for reconnaissance work, leaving the detail to some more appropriate instrument.

The gravimetric method of exploration immediately suggests the principle of its operation: the variation of the force of gravity by geologic structures. The magnitude of this force is proportional to the mass producing it and varies inversely with the square of the distance from it. The direction of gravity would be practically vertical if there were no irregularities in the earth's crust to distort it. The classification and measurement of these local anomalies form the basis of gravity surveying. Observations of the magnitude and direction of the distorted field point the way to the disturbing element. Usually the anomaly is presented by a mass of higher than average density, but masses of low

density also offer possibilities. Topographic variations affect gravity measurements, and when possible, their effect must be computed as a correction to the observations.

In practice, most of the gravity surveying in the Southwest is done by the use of the torsion balance. This highly developed instrument measures the change of gravity in horizontal directions, showing the horizontal gradient and the departure of lines of force from normal. It is illustrated by many commercial forms and, in general, consists of a torsion pendulum of two weights, so related that only the horizontal component is observed. The torsion balance has found wide use in oil field exploration with varying degrees of success. The interpretation of the observations is an extremely detailed and complicated process, depending to a great degree upon the skill and experience of the interpreter. Without adequately trained personnel, the results of this work are likely to be unsatisfactory.

Its greatest success has been found in the Gulf Coast region. Here the large irregularities presented by salt domes protruding up into the surrounding alluvium make possible rapid and satisfactory interpretation. In areas of complicated geology, the success of the torsion balance has not been universal beyond the location of large, deep-seated mountain ranges. Further research may develop the instrument to a more universal utility if present tendencies continue. Surface irregularities cause confusion in making interpretation, particularly when corrections are unavailable. (Continued on page 410)



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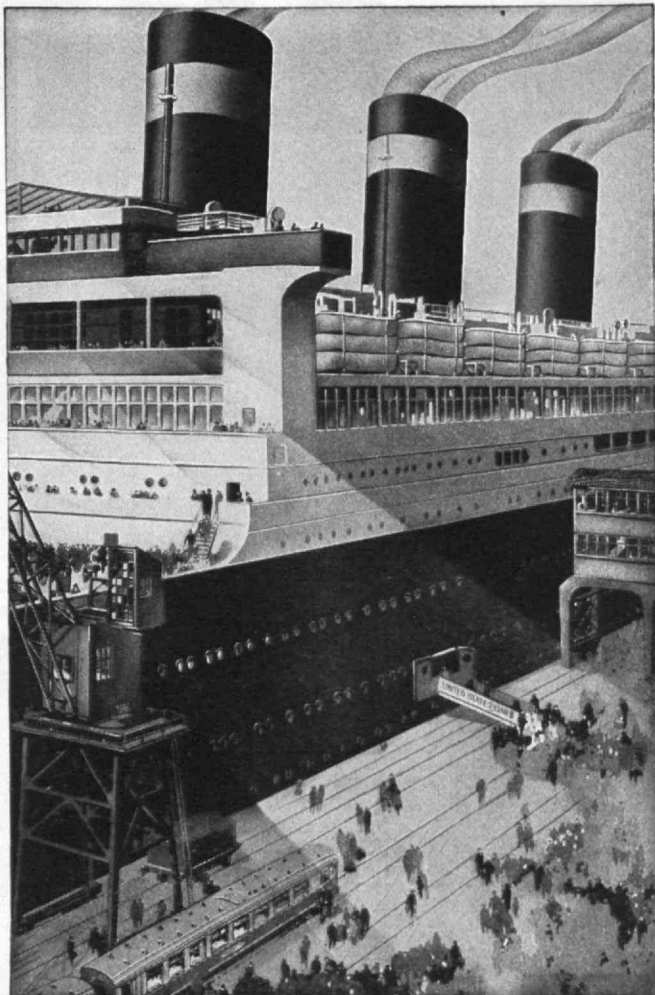
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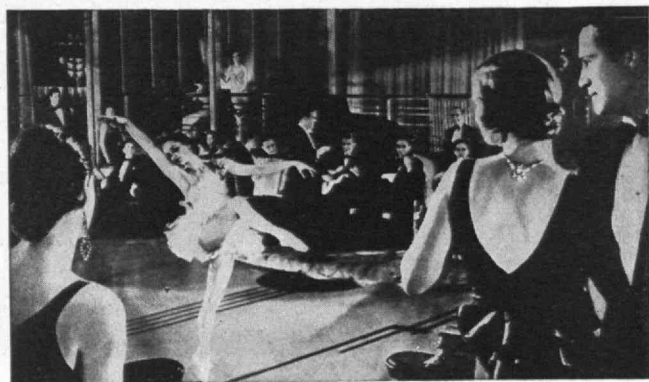
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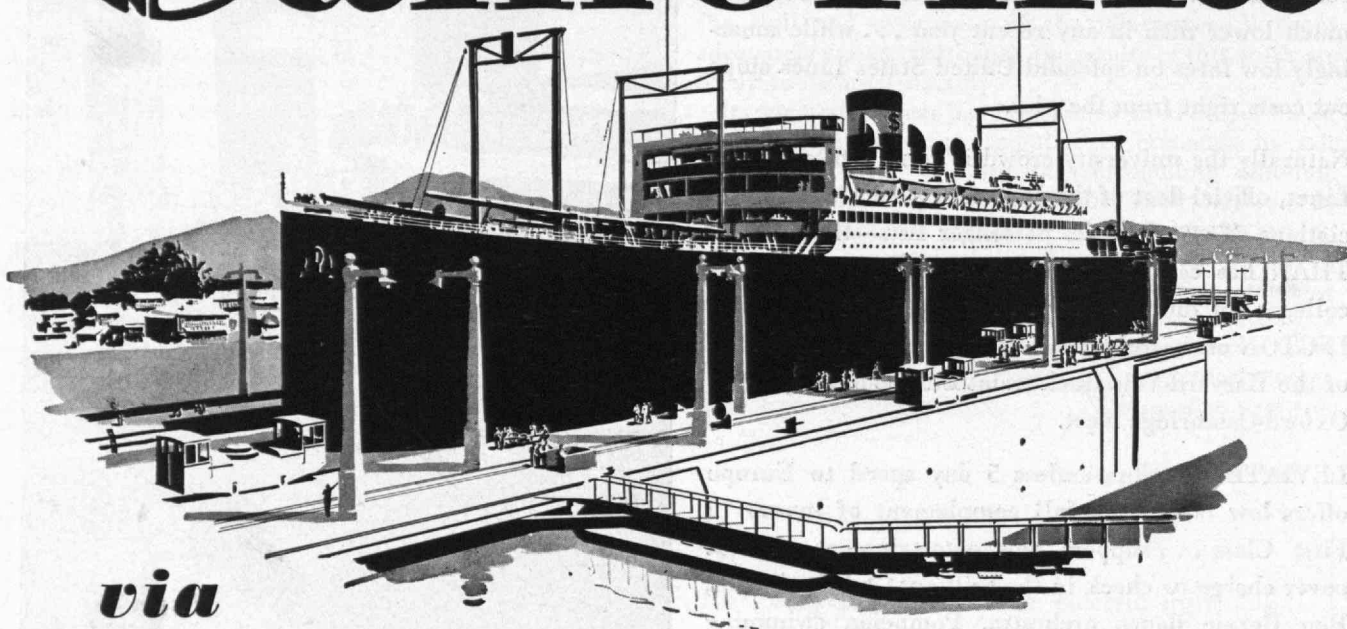
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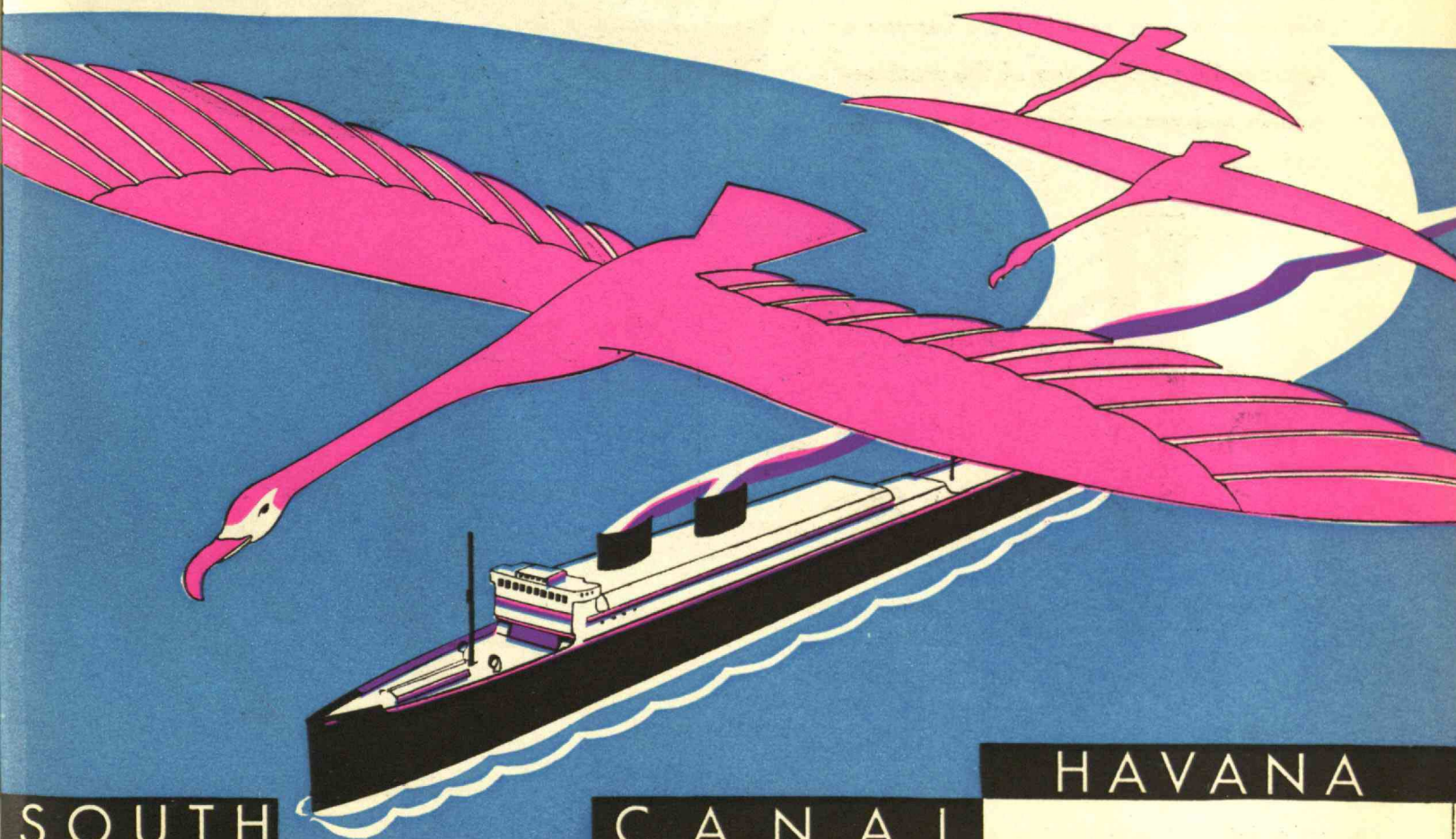
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DOODLE-BUGS DEPOSED

(Continued from page 406)

The seismic method of exploration has rapidly grown to a large and important position in oil location. From an experimental beginning in 1919, the various systems of this type have received continued improvement, and today the method offers the greatest immediate promise of widespread usefulness. The instruments are an adaptation of the earthquake seismograph, which records vibrations of the earth's crust originating at some distance from the point of observation.

In the location of oil by this device, a charge of dynamite is exploded at a suitable point, which sends out in all directions a miniature earthquake, or seismic wave. Some of these waves travel along the surface of the ground to the recording device, located at some distance from the dynamite. Other waves penetrate into the earth, striking the various rock formations in their path. Following the laws of light and sound waves, these impulses are refracted and reflected, thereby returning in part to the surface recording device. The exact time of the explosion being recorded by electrical or other means, it is possible to determine how long the waves required to complete their journey downward and return. The echo from subsurface formations makes its own record on the instruments, and from these records it is possible to compute the depth of the refracting or reflecting horizons. A detailed map of the formations is obtained by moving shot point and recorders over the country.

The seismic method has grown to become the most versatile of all geophysical methods. Accurate corrections are made for topographic conditions as it is equally useful in delineating shallow (20 ft. to 2000 ft.) or deep features (up to 20,000 ft.). There are few regions where the method will not give indications of some value. So long as there is some formation having greater hardness and rigidity than overlying members, refractions or reflections can generally be obtained. The total cost of operation is greater than that of other methods, but its ability to give reliable data more than offsets this disadvantage. It is a method more suited to the detailed survey of considerable areas, rather than a casual application to a local section. It appeals to the geologist very strongly because it is at present the only method which presents the results of a survey in terms with which he is accustomed to dealing. The accuracy of the observations is equal to that of measuring well-drilled holes. Ultimately, the seismograph gives the geologist the same kind and amount of data he would obtain from a well log compiled from sample cuttings. Wells cost from \$15,000 to \$500,000. The seismograph reports a depth for \$100 to \$150.

Of course it is not fair to make a comparison on the basis of one depth. A rancher, whose land was not far from a prospect being surveyed by a seismograph crew, inquired how many shots it would take to cover his land. He had been watching the work, and had a fair idea of the cost of the shots. When he was told that six or seven would be sufficient, he was at once very anxious to have the crew come over on his property (Continued on page 412)

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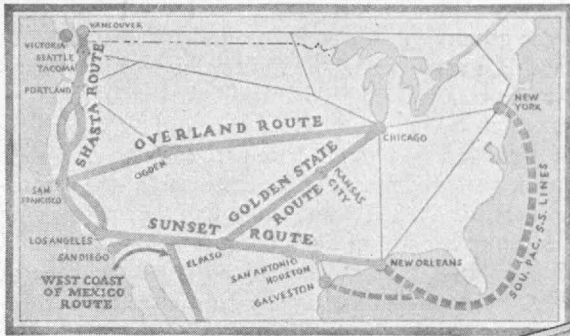
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Name

Address

705

DOODLE-BUGS DEPOSED

(Continued from page 410)

and work. It was hard to explain to him that he would be wasting his money because the information taken on his land was worth little unless it was tied in with similar data taken throughout the neighborhood. Any geophysical survey depends for its success upon the accumulation of considerable data and the correlation thereof with known geology.

THERE is another form of prospecting for oil which has given considerable service in some areas, an extension of surface geology by the use of the core drill. In regions where surface outcroppings are lacking or unreliable, some success has been achieved by drilling through the shallow beds to one or more reliable markers. If such markers can be found a few hundred feet below the surface, core drilling is considered to be very satisfactory. Provinces of this kind are comparatively rare, however, and in many sections it is necessary to core to one or two thousand feet in order to find a widespread common datum. The core drill, as its name implies, cuts a cylindrical core from the rock formations, which are classified and logged by geologist or paleontologist. Structural indications found on these data are assumed to indicate similar and deeper structures whereupon oil may have accumulated.

The cost of core drilling varies with the hardness of the rocks being drilled and it is difficult, therefore, to estimate the average cost of such work. In the Mid-Conti-

nent fields, costs run from \$1.00 to \$1.25 a foot for shallow coring (500 feet); these figures may rise to \$2.00 a foot at depths from 1,500 to 2,000 feet. In contrast with this type of work, it is striking to point out that seismographs work to depths of 12,000 feet or more for a cent to a cent and a half per foot.

An understanding of the operation of the seismograph is most easily developed by a description of its construction and principles of operation. The earliest instruments were very much like earthquake detectors. A large mass, suspended from a light, rigid case by means of springs, was so arranged that the relative motion between the two could be recorded. The instrument was set up on the surface of the ground, protected from wind and disturbances by means of a small tent. The motion between the mass and case was transmitted mechanically to a small rotating mirror, which made a photographic record by the reflection of light upon a moving sensitized film. A clock mechanism provided means of time measurement, recording its intervals on the same film. Early developments depended upon the use of a stop watch at the firing and recording points. At a predetermined time a charge of dynamite was exploded and at the same time the recording instruments were in adjustment to receive the impulses. This arrangement, called the mechanical seismograph, is now largely superseded by the electrical type.

Even with relatively crude apparatus, the seismograph gave an early promise of successful performance. To make it more adapted to the requirements of petroleum exploration, it was necessary to increase (Continued on page 414)

In all times of stress a strong anchor of safety

Our 1930 Financial Statement

shows
this Company
holding
its usual strong
position in
Resources
and
Surplus
Funds



| | |
|--|-----------------------|
| Admitted Assets, December 31, 1930 | \$584,121,813.41 |
| Reserves and all other liabilities | 541,320,308.97 |
| Surplus of Assets for Emergencies | 42,801,504.44 |
| <hr/> | |
| Income Received in 1930 | 154,381,579.65 |
| Added to reserves during the year | 35,007,828.00 |
| Paid to Policyholders | 75,121,420.00 |
| Total Paid Policyholders in 68 Years | 681,561,755.00 |
| Invested on Policyholders' Account during the | |
| Year | 82,300,519.03 |
| Dividends paid policyholders in 1930 | 18,620,863.25 |
| Reserve for policyholders' dividends in 1931 . | 20,220,000.00 |



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Newest of Trains in the West—

New North Coast Limited



This Album Free!

DOODLE-BUGS DEPOSED

(Continued from page 412)

its depth range, resolution of adjacent formations, and, above all, its accuracy. These features were difficult to develop in mechanical instruments and accordingly the electrical type was invented. In this system multiple recording seismometers are employed, each of which is connected by cable to a central recording station. By radio or telephone, the firing point and the recorders are in constant communication, thereby recording the exact instant of the explosion on the moving film. The inaccurate timing of the old system was one of the principal weaknesses. Today time measurements are made to an accuracy of one one-thousandth of a second through an application of sound electrical engineering principles. As a result of this development, we now find depths being measured with an accuracy of one half of one percent.

The detectors of the earth waves, called terraphones, geophones, or seismometers, are electrical devices designed to convert the effect of ground motion into an electric current. Microphone buttons, condenser transmitters, electromagnetic instruments similar to radio loud speakers, are some of the forms which have been adapted to this purpose. Each seismometer receives impulses from the explosion and transmits them electrically to the recording station, where they are amplified by vacuum tubes and recorded on the film by galvanometers. The distance between the firing point and recorders, as well as the respective sea level elevations, completes the data required for the computations.

The method of procedure in geophysical surveys is well adapted to the needs of a production job and is by no means an experimental undertaking. All of the movements of the crew are well laid out in advance, for a definite schedule must be maintained regardless of weather conditions. About the only thing that has actually prevented field operations throughout the past five years has been a tropical deluge or one of the famed Panhandle blizzards. In spite of apparently unbearable field conditions, the work has steadily progressed, even in the swampy lands of Louisiana, where considerable maneuvering has been accomplished in boats and pirogues.

For the greater part, this type of work is very attractive to young engineers and technical graduates. A seismograph crew offers a wide variety of interests and a promise of a lively and profitable career. There is considerable moving about the country, with a delightful combination of healthful out-of-door work and genuine scientific endeavor. A seismograph party is a well-coördinated unit, each individual's activities dovetailing into the others' with a maximum degree of coöperation. All of the technical men have real personal responsibilities and for that reason, men of somewhat better than average ability are frequently found in this work. This condition prevails because of the impracticability of maintaining detailed supervision over each man. In general, the remuneration is in keeping with the difficulties and responsibilities of the position.

In charge of a crew is the party chief, a man of mature judgment, some graduate training in physics or electrical engineering, and a capable leader (*Continued on page 416*)

FREDERIC W. LORD '93, *Pres.*

THOMAS P. CURTIS '94, *Vice-Pres.*

LORD ELECTRIC COMPANY INC.

Electrical Contractors

301-303 COLUMBUS AVENUE
BOSTON

Our experience and past success warrants your attention

Over eight thousand (8000) completed contracts aggregating in excess of sixty million dollars (\$60,000,000)

Offices in

BOSTON

NEW YORK

PITTSBURGH

HARTFORD

NEWARK

THE GRID SYSTEM

OF CONCRETE CONSTRUCTION

A new and economical flat slab form of construction for floors and roof, made upon removable steel domes—Giving

GREATER STRENGTH • LESS WEIGHT • LOWER COST



The GRID SYSTEM has been used in schoolhouses, churches, hospitals, manufacturing buildings, warehouses, garages and many other types of construction.

The following is a partial list of buildings constructed with the GRID SYSTEM in 1930

SCHOOLS

| | |
|----------------------------|--------------------|
| Abraham Lincoln | Cambridge, Mass. |
| Wright Street | Stoneham, Mass. |
| Orne Street | Salem, Mass. |
| Lynn Eastern Senior High | Lynn, Mass. |
| Alexander Hamilton | Boston, Mass. |
| Girls' Vocational | New Bedford, Mass. |
| Woburn High | Woburn, Mass. |
| Henry Wadsworth Longfellow | Cambridge, Mass. |
| Notre Dame de Lourdes | Lowell, Mass. |
| Elihu Greenwood | Boston, Mass. |
| Arlington High | Arlington, Mass. |
| Needham High | Needham, Mass. |

FIRE STATIONS

| | |
|-------------------------------|-------------------|
| Brookline Fire Station | Brookline, Mass. |
| Belmont Fire Station | Belmont, Mass. |
| Engine No. 9 and Ladder No. 2 | Boston, Mass. |
| Central Fire Station | Fall River, Mass. |
| Bowdoin Square Fire Station | Boston, Mass. |

MANUFACTURING BUILDINGS AND GARAGES

| | |
|---------------------------------|-------------------|
| Service Bldg.—1380 Boylston St. | Boston, Mass. |
| Providence-Cadillac | Providence, R. I. |
| Brookline Service Bldg. | Brookline, Mass. |
| Elmwood Street Garage | Newton, Mass. |
| M. A. Gammimo's Garage | Providence, R. I. |
| American Oil | Cambridge, Mass. |
| Cary Maple Sugar Factory | Lennoxville, Que. |
| Burnett Building | Cambridge, Mass. |
| Lewandos Building | Watertown, Mass. |

EDWIN F. ALLBRIGHT '04
Sec. and Engineer

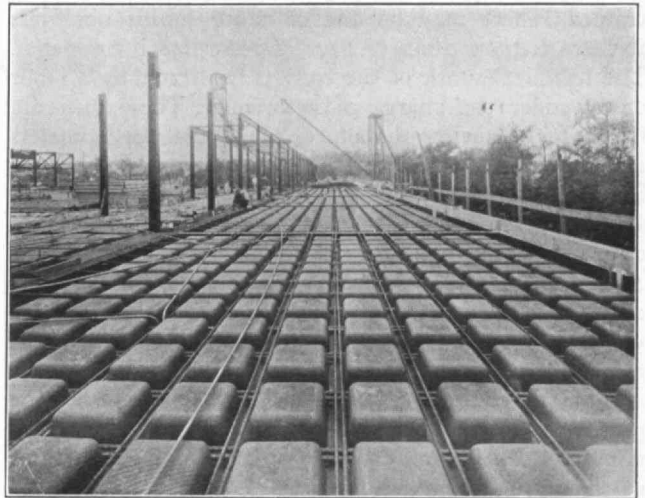
WILLIAM F. BARRETT '22
L. P. KOOKEN '30

ROBERT F. POND '25
Supr.

DAVID M. MATHOFF '28
OSCAR H. HOROVITZ '22
Field Eng.

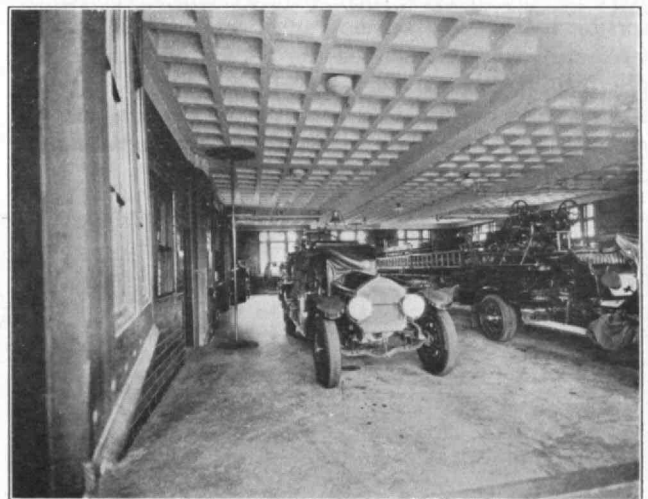


GRID FLAT SLAB CORPORATION
761 DUDLEY STREET • BOSTON, MASSACHUSETTS



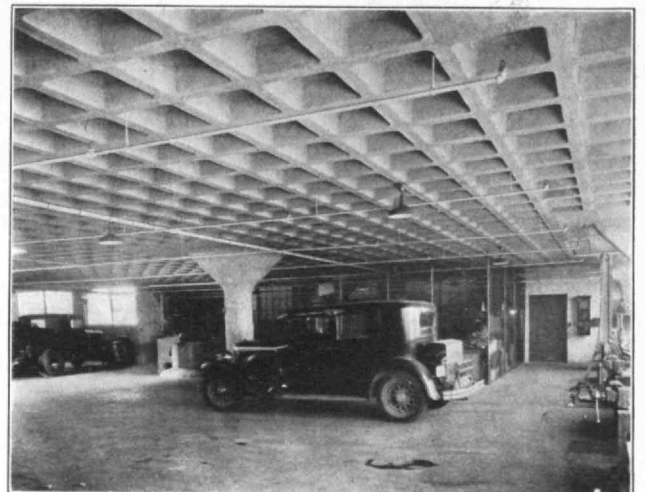
Eastern Senior High School, Lynn, Mass.

SANBORN & WEED, Architects
J. R. WORCESTER & Co., Engineers



Brighton Fire Station, Boston, Mass.

RALPH T. JACKSON, Architect
FAY, SPOFFORD & THORNDIKE, Engineers



Providence Cadillac Sales and Service Bldg.

ALBERT KAHN, Inc., Architects and Engineers

DOODLE-BUGS DEPOSED

(Continued from page 414)

of men. The field crew is under the immediate supervision of the chief observer, who is likewise technically trained. There may be one or more junior observers if there is more than one set of recording instruments. The technical work of the crew is facilitated by a labor crew, under the charge of a foreman. These men dig holes for planting dynamite, place the seismometers and cables in position under the direction of the chief observer, and carry on general roustabout service. A shooter, trained in the matter of handling and planting dynamite, supervises the procedure at the firing point. A surveyor and his rodman lay out positions in advance and advise the chief observer where he is to work. An average day's work consists of from three to five depth points.

A survey of the applications of geophysics during the past seven years shows a rapidly widening field of usefulness. In 1924 the first extensive commercial applications of the seismograph were begun. Two salt domes were discovered on the Gulf coast in this year. Nineteen twenty-five saw the discovery of four more. In 1927, there were 26, and in 1929, there were 35 domes reported by torsion balance and seismograph operators. During the twelve months just elapsed the appropriations for geophysical work have increased three times the amount spent during the previous year. At the present time the growth is still increasing in spite of the overwhelming depression of the oil industry.

In contrast to this unprecedented growth stand the decreasing appropriations for strictly geological methods of exploration. Practically all producing companies have been obliged to reduce the scope of their geological departments on account of the superabundance of oil and the prevailing low prices. Today it is cheaper to buy oil at the open market than to drill and produce it. If this is so, what warrants the increasing expenditures for geophysics?

For one thing, geophysical methods have proved their ability to seek out oil pools with considerable success when guided by intelligent manipulation. The percentage of failures of these methods has grown less each year of their service. Scores of technical men have become experts in the art of interpretation and their experience has become a major factor in the reliability of the methods. Geologists have come to regard geophysics as a friendly aid to their own endeavors rather than a hostile competition. Through its use, the range and value of geologic data have become increasingly valuable. Progressive executives, quick to estimate the economic phase, find it valuable in guiding their policies of lease distribution. Even if no oil is found, geophysics often earns its fee many times over by the scientific selection of existing leases into good and bad.

The biggest factor in the present rate of growth is caused by its own momentum. Nearly every major company has some large part of its development work devoted to geophysics. The companies regard each other keenly, for no chances may be lost in this game. Everyone must give the new science a (Concluded on page 418)

THE TREDENNICK-BILLINGS CO.

Building Construction

10 HIGH STREET, BOSTON



**EIGHT STORIES
IN 96 HOURS**



**ATLANTIC NATIONAL BANK ADDITION
POST OFFICE SQUARE, BOSTON**

The Thomas M. James Co., Architects
3 Park Street Boston

WHEN**THE GARDEN DOOR OPENS**

Soon frozen lumps of lawn will thaw into welcome green, and gunny-sack cowls will be stripped off the rose-bushes . . . soon red and yellow sparks of tulips will burst into flame under the May sun. . . . When you've opened the garden door for the summer—let it open on a world of bloom that lasts till the frosts of Autumn. Clouds of roses, dashing brilliant zinnias, strange varieties of lilies from distant lands—House & Garden will tell you how to plant and care for every flower.

House & Garden will help you plan your whole gardening season—so there'll be no lapses

in mid-August when you'd have to blame the heat for scarcity of bloom. House & Garden will show you garden furniture for lazing under the evergreens, and help you make those jaunty summer curtains and slip-covers that seem to grow a garden indoors.

House & Garden will not fail you—in the details, or in the important decisions about building, or decorating, or gardening. Send in the coupon to-day for a five months' subscription. The price is only \$1—a small premium to pay for a whole summer of charm and beauty in and about your home.

**SPECIAL OFFER TO NEW SUBSCRIBERS ONLY****5 ISSUES OF HOUSE & GARDEN FOR \$1**

House & Garden, One of the Condé Nast Publications, Graybar Building, Lexington at 43rd, New York City

☐ Enclosed find \$1 for 5 issues of House & Garden

☐ Enclosed find \$3 for 1 year of House & Garden
NAME**STREET****CITY****STATE**

JLM-3-31

DOODLE-BUGS DEPOSED

(Concluded from page 416)

trial, and the gratifying feature of this trend is the continued success which comes after a fair trial. True, a few may casually inquire and discard the method after a hasty examination, but these occurrences are not the rule. Geologists who become intimately familiar with geophysics are intensely enthusiastic after their first acquaintance and thereafter no other method seems adequate. By leaps and bounds, this new science has reached a place of permanent importance.

THE PILL OF IMMORTALITY

(Concluded from page 385)

great sin on my part not to transmit the Tao (Way) which would otherwise be lost to the world forever. I shall not write on silk lest the divine secret be unwittingly spread abroad. In hesitation I sigh. Without cessation I ponder. There are directions for the processes, the more important principles of which shall be set forth but the details shall not be divulged. . . .

"Treatment and mixing will bring about combination and rapid entrance to the scarlet portal. The escape must be firmly blocked. Below plays the dazzling flame, while the Dragon and Tiger keep up a sustained vociferation. The flame at the start should be weak, so as to be controllable, and should be made strong at the end. Close attention and careful watch should be given so as to regulate properly the heat and cold. There are twelve divisions to the cycle. On the completion of the cycle a closer watch should be accorded. As the breath expires, life is ended. Death expels the spirit. The color changes into a purple. Behold! the *Huan Tan* (Returned Medicine) is obtained. This is then made into pills. These are extremely efficacious, although their individual size is so small that they occupy only the point of a knife or the edge of a spatula. . . .

"O, the sages of old! They held in their bosoms the elements of profundity and truth. Having compounded and partaken of the medicines prepared in the nine *Tings*

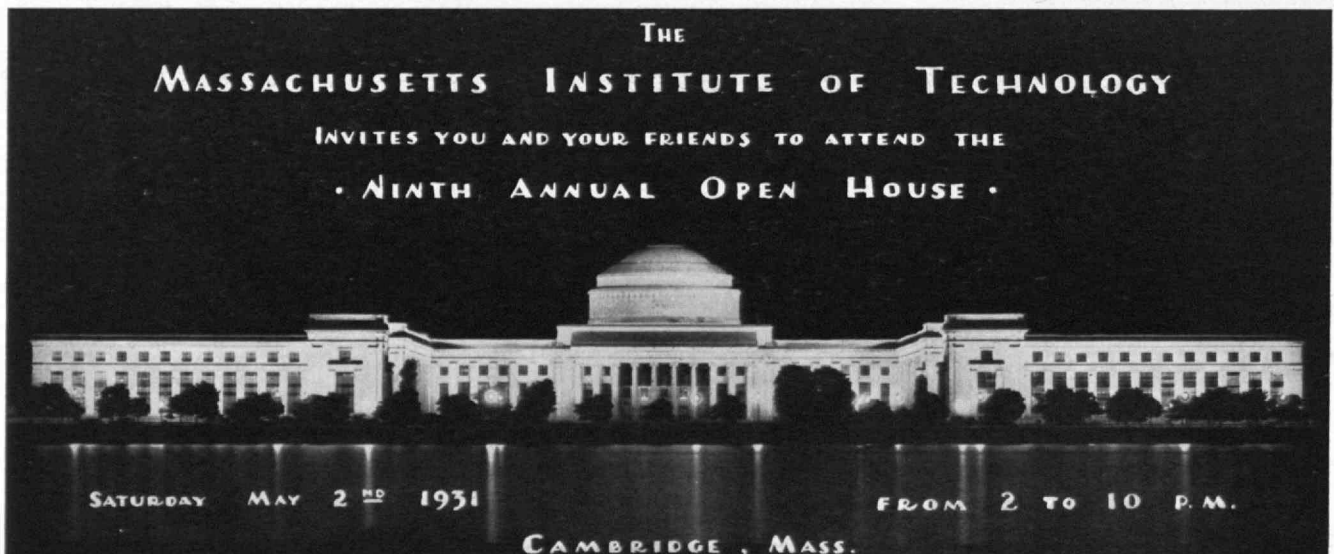
(furnace pots), they were endowed with the power to disappear at will. They held the essence firmly and cultivated their spirit, and they thereby attained communion with the three primes. The essential fluids worked properly to give them fine, strong bones and muscles. . . . In the course of time they became immortals.

"Their sympathy for those of posterity, who might have a liking for the attainment of the *Tao* (Way), led them to explain the writings of old with words and illustrations. They couched their ideas in the names of stones and in vague language so that only some branches, as it were, were in view and the roots were securely hidden. Those who had access to the discourses wasted their own lives over them. The same path of misery was followed by one generation after another with the same failure. If an official, his career was cut short; if a farmer, his farm was cluttered with weeds; if a merchant, his trade was abandoned; if an ambitious scholar, his family became destitute — in the vain attempt. These grieve me and have prompted the present writing. Although concise and simple, yet it embraces the essential points. The appropriate quantities and processes are put down for instruction together with confusing statements. However, the wise man will be able to profit by it by using his own judgment. . . .

"All this is the work of nature and has nothing to do with untoward doings. It is like the fact that the *Ch'i* (Ethereal Essences) of the mountains and the waters rise to give clouds which then become rain. Again, it is like the reduction of mud to give dust and the destruction of fire to give earth.

"The bark of the *Nieh* tree dyes yellow and the *Lan* (indigo) dyes blue; the boiling of hides yields glue; and the *Ch'u Nieh* (yeast) ferments to give liquor. It is easy to get results when the starting materials and the desired products are of the same kind. Otherwise, it is very difficult. . . .

"The aspirant should study this thoughtfully and thoroughly, viewing it from all angles. A thousand readings will bring out some points, and ten thousand perusals will enable him to see. At last revelation will come to bring him enlightenment. Careful study will open the door to the secrets. Nature's *Tao* (Way) shows no partiality, but reveals to all who are worthy."



If you hurry



You too may have a set of the Technology Wedgwood Plates for the Summer season.

ONE TECH HOSTESS WRITES:

"Thank you so much for the Technology Plates. Already they have saved a dinner party where a difficult group got so enthusiastic about the plates that the evening was 'made' even before the soup was served."

But besides their conversation-provoking merits they are really beautiful and, of course, Wedgwood. If your order is postmarked by May first, sets may be had at the old prices.

Staffordshire Blue—\$13.00 per set of 12
2 sets for \$25.00

Mulberry—\$15.00 per set of 12



AFTER MAY 1, 1931, new prices will be effective

Staffordshire Blue—\$14.00 per set of 12
2 sets for \$27.00

Mulberry—\$16.00 per set of 12

Send orders to THE ALUMNI ASSOCIATION, ROOM 3-225, M. I. T., CAMBRIDGE, MASS.
(*\$4.00 deposit required on all orders*)

Additional items in the Wedgwood "Tech" pattern may be had in blue or mulberry to match the Tech plates. Please specify color wanted, enclosing check, or if C. O. D. forwarding deposit of one-half the amount.

| | | | |
|---|-------------------|----------------------|-------------------|
| Tea Plates | \$10.00 per dozen | Tea Cups and Saucers | \$10.50 per dozen |
| Sugar Bowl | 3.00 each | Cream Pitcher | 1.75 each |
| Tea Pot | 3.50 each | After Dinner Coffees | 10.00 per dozen |
| Meat Platter with Airplane View of Tech (16") | | \$5.00 each | |

PRICES OF OTHER ITEMS GLADLY QUOTED ON APPLICATION

For merchandize other than Technology plates

Address orders and make checks payable to

JONES-McDUFFEE-STRATTON

367 Boylston Street

Boston, Mass.

Let's Go Up to Dennie's Place!



DOUGLAS INN

DOUGLAS HILL, MAINE

{In the Town of Sebago}

340 Acres Woodland Country

Remembered for

Fine Table Own Farm and Dairy

Nine-hole Golf Course

Fishing and Hunting

Boating, Bathing

ORVILLE B. DENISON, '11, PROPRIETOR

BELGRAVE PRESS

INCORPORATED
PRINTERS

230 W. 17TH ST.  NEW YORK

CHARLES E. FOX, '14
TREASURER

C. H. CARPENTER, '12
SALES

STEAMING UP

(Continued from page 382)

or 23% less than in 1922. . . . These data may be taken as authentic for they are drawn from that incomparable statistical reservoir of the railways, the reports of the Interstate Commerce Commission. But, as a comparative measure of fuel economy between the best engines of 1922 and 1929 they are of no value whatsoever. They do represent most strikingly the decline in the average number of pounds of coal (with other fuels equated) consumed per thousand gross ton-miles of load hauled, including the locomotive itself, its tender and cars, for all the locomotives operating on all the Class I railroads of the United States.

This tremendously gratifying showing is due to a variety of causes such as better organization of the railroads following their return from Federal control, better management, better qualities of coal made possible through advances in mining methods, as well as the modernizing of old locomotives and the replacement of old locomotives by new, modern machines. It might be argued that the number of new locomotives introduced in the last five or ten years has been entirely too small to account for much of the reduction in the average fuel consumption rate. The total inventory of locomotives in use at the beginning of 1931 was 60,400, of which only 4,529 had been purchased within the last five years, and only 12,007 within the last ten years, or 7.5% and 20%, respectively. The records also indicate that the proportion of locomotives ten years of age or less in the total inventory has declined every year since 1911 as compared with the preceding year. In 1911, 61% had been purchased within ten years; at the outbreak of the War, 54%; when the roads were turned back to private ownership, 39%; in 1924, 26%; today 20%.

While numerically true when locomotive units alone are considered, the above data are misleading if locomotive capacities measured by tractive effort or other performance unit be the criterion. The typical "coal hog" purchased during the ten years preceding 1911 is hardly comparable with a typical ten-year old locomotive of the present. Thus the Yearbook of Railroad Information (1930 edition) issued by the Committee on Public Relations of the Eastern Railroads shows that the total number of locomotives in service in 1929 was 1% less than in 1911 but the average power of each unit in service in 1929 was 58% higher than in 1911.

Therefore, just what proportion of the reduction in the average fuel consumption rate may be properly credited to progress in locomotive design as expressed by the introduction of new motive power, or the modernizing of old locomotives retained in service, is somewhat of an open question. Most certainly it would have been greater than it is if the finances of the carriers had permitted them to invest more money in new locomotives. Although the railroads spent about \$870,000,000 on improvements during last year, this vast sum had to be spread over various classes of work to none of which could be devoted as much as might profitably have been employed.

It is manifest that, without any further perfection in steam locomotive design, the effect of what is now at hand will, as it is brought more *(Concluded on page 422)*

Books

A Review subscriber asked The Technology Review Book Service to select and obtain for him a sound, readable book on mental diseases. A book on that subject was immediately sent to him and his reaction was expressed in a letter as follows:

"Kindly accept my sincere thanks for prompt and invaluable assistance in obtaining for me exactly the type of book desired. . . . This service alone is worth to me many times the cost of a year's subscription to The Technology Review."

The Technology Review Book Service constantly is rendering service to Review readers. It orders books for them at the published price from publishers the world over, and it searches the second-hand book shops for volumes out of print. For others, like the writer of the adjacent letter, it has the happy opportunity of suggesting desirable books and preparing bibliographies on specific subjects. Readers are urged to avail themselves of its services.



THE TECHNOLOGY REVIEW BOOK SERVICE, ROOM 11-203, M.I.T., CAMBRIDGE, MASS.

STEAMING UP

(Concluded from page 420)

completely into use, insure steam's continued prestige for a long time. The lengthening of engine runs in passenger and freight service accomplished within the past few years illustrates what may be expected from the application of what, so far as engineering skill is concerned, has been at hand a long while. A discussion of the import of extending the accepted distances for locomotive runs, together with a survey of probable future trends in steam locomotive design, will appear in The Review for next July.

BABBLE IN THE AIR

(Continued from page 388)

I believe that those broadcasting features which have the strongest hold on the real interest and affection of the American people are the non-advertising, serious features. Dr. Cadman's and Dr. Fosdick's Sunday afternoon services, the Catholic Truth hours, Seth Parker's Jonesport hymn-singing circle, Walter Damrosch's morning musical talks and illustrations for school children, the Philharmonic concerts, and the like. (I am speaking only of the great chain broadcasts, the only ones I hear.) Next to them come the popular programs of interesting features and good popular music with a minimum of advertising, Amos and Andy, of course, the General Electric hours with Floyd Gibbons and Damrosch, the Lucky Strike dance music, Whiteman's band on a commercial pro-

gram, the Philco musical period, the Collier's hours, the Jenney band, Big Brother, Kaltenborn Edits the News, and the great, sponsored, athletic broadcasts. None of these deserves Mr. Orton's contempt.

Nearly all local advertising is bad. Snippets of time, too much advertising, cheap talent, the ubiquitous business man insisting on doing his own talking instead of leaving it to an expert announcer, and entertainment "routine" often remarkable for silliness, vulgarity, and ineffectiveness. Almost as bad are the programs arranged for women — commercial shopping advertising which often tries to pass itself off as disinterested expert opinion, high-flown ingenuity in matters of house decoration, novelties in cooking and the like, interspersed with commonplace records. Children's programs are almost invariably fantastic, affected and grotesque, unworthy the attention of an intelligent, normal child. Banks and financial institutions are the worst offenders as to dull and long-winded technical discussions about investment and budgeting. Stray fragments of time are often filled at local stations by improvised frolics and stunts by the studio personnel, dreary beyond belief. Most of this stuff is well below the "thirteen year old" limit Mr. Orton talks about. Were it not for the great chain advertising features, if we had to rely on the local station's economies and improvisations, we should fare badly indeed.

SOME remedies are suggested. It may be that some day we shall have selective programs by wire for which the listener pays a fee, knowing in advance what he is to get. I have been told that people *(Concluded on page 424)*

Use Roller-Smith Apparatus for INDICATION REGISTRATION PROTECTION



SATISFACTION is Always the Result

Bulletins covering the various devices will be sent on request

OVER 40 YEARS' EXPERIENCE IS BACK OF

ROLLER-SMITH COMPANY
Electrical Measuring and Protective Apparatus



Main Office: 233 Broadway, NEW YORK
Offices in Principal Cities in U. S. A. and Canada

Works: BETHLEHEM, PENNA.
JOHN R. SANBORN ('04), Vice-President and General Manager



Products

*comprise complete lines
of*

Electrical Instruments

Indicating and Graphic



Circuit Breakers

Air and Oil



Relays



Control Panels

Commercial Photographs
Lantern Slides

Portraits and Framing
Copying

Amateur Finishing
Enlarging

TECHNOLOGY PHOTOGRAPHIC and PHOTOSTAT SERVICE
ROOM 11-003—M. I. T.

Special attention given mail orders

Liquid Sulphur Dioxide, SO₂

ESOTOO

TRADE MARK REGISTERED U. S. PATENT OFFICE

for

Refrigeration, Textile and Chemical Uses

*Our refrigeration grade EXTRA DRY
ESOTOO is guaranteed to contain not
over 50 parts of moisture per million.*

VASO and VASITE - Stripping Agents

VIRGINIA SMELTING CO.
WEST NORFOLK, VA.

A. H. EUSTIS, *Vice-Pres.*

F. A. EUSTIS, *Sec'y-Treas.*

C. W. JOHNSTON, *Gen. Manager*

F. W. BINNS, *Engineer and Salesman*

M. I. T. Special '03

M. I. T. Special '03

M. I. T. '05

M. I. T. '21

131 State St., Boston and 75 West St., New York, N. Y.

B.I.W.
"Quadridge"



**Portable
CABLE**

QUADRIDGE CORD is identified by four longitudinal ridges in the surface of the rubber and represents a high quality cord made for severe service.

QUADRIDGE CORD is vulcanized in a steel mould under high pressure resulting in a dense, tough, and smooth rubber jacket which offers the best resistance to the twisting, bending, and abrasion of service.

QUADRIDGE CORD is constructed in the sizes and number of conductors that are required for all the various portable electric machinery and appliances for the factory, office, or home.

For a better portable cord, call for

QUADRIDGE

"Quality of product is our first consideration"

**BOSTON INSULATED WIRE
and CABLE COMPANY**

BOSTON, MASS.

THE PHOENIX BRIDGE COMPANY

PHOENIXVILLE, PA.

Steel Bridges and Buildings

The COPLEY-PLAZA *Boston*

Recognized as one of the finest hotels in the world, richly furnished, modern in every respect . . . located in historic Copley Square, probably the most accessible and attractive spot in Boston. Rooms \$4 and up.

ARTHUR L. RACE
Managing Director



Tea Dances every Wednesday and Saturday afternoon
—4:30 to 7

Supper Dances nightly.

Music, Meyer Davis
Le Paradis Band,
direction of Joe Smith.



HOTEL OF
DISTINCTION

ROTOGRAVURE ▼ PRINTING ▼

A Complete Rotogravure Department, the first installation in New England by a commercial printing firm, is now in full operation at our plant. This new department is equipped to produce ROTOGRAVURE PRINTING in any desired form and quantity. A complete service, including photography, art work and copy writing, is available. It is our intention to produce ROTOGRAVURE PRINTING of quality comparable to that of our book, catalog and general commercial printing.

THE MURRAY PRINTING COMPANY
KENDALL SQUARE · CAMBRIDGE

TELEPHONE **5650** UNIVERSITY

BABBLE IN THE AIR

(Concluded from page 422)

are working on a speech-filter which will tune out talking and let only music through — but that seems almost too fantastic. A demand has been made that Congress insist that the F.R.C. clear 15 full channels for educational and governmental use, but there the vested interest of our common law steps in. It has been suggested that every licensed station be required to give up a certain number of hours for non-advertising features supported at its own expense. That would tend, undoubtedly, to force the little incompetent local stations out of business. Most of these seem possible, one or two seem even probable.

I have one suggestion for the music lover who complains of the constant repetition of popular dance music and little good music: It would involve the intelligent use of the phonograph. The music machine, as you know, is under a cloud in radio. Stations are not allowed to play records for more than a stated minimum of time. As usual in America, the emphasis is on the machine and not on the quality of the product. One has only to look at the music section of the *American Mercury* to realize that there are dozens of recordings of great classical and distinguished modern music being made by great musicians and orchestras. These do not belong in the class of records that are played between department store advertising items. They are infinitely better than the general run of music furnished on the air by living musicians, the second-rate trios, and little orchestras and dance bands.

If some intelligent advertiser, or even some intelligent local station, were to announce a regular hour of the very finest recorded music, selected by a musical expert, and were to advertise it so that even people like Mr. Orton could not help finding out about it, large numbers of people would have their music problem solved. At present they are giving up the radio in despair and buying these expensive records. A good record would certainly go on the air as perfectly as a mediocre assemblage of studio musicians. Advertise it deliberately as a "high-brow" musical program, intended to bring cultivated people back to the radio. It might have some result!

A YOUNG MAN'S BUSINESS THAT EARNS UPWARDS OF \$5000 A YEAR

START MAKING MONEY from the beginning. Young college engineers, new graduates and alumni interested in the construction field can start out working for themselves—and earn upwards of \$5000 a year in Crane Service—a self-owned, self-bossed business which yields big returns on a small investment. Not a sales job—actual construction work. Interesting details available. Address:

CRANE SERVICE ASSOCIATION, Lorain, Ohio

IMPORTANT MESSAGE *to the* ENGINEER

THE TECHNOLOGY BRANCH is operated for students and men of the engineering profession. We are in a position to save you money on numerous articles. If you are contemplating the purchase of any article listed below, check the coupon, mail it to us, and we will gladly quote you a price and description. We guarantee absolute satisfaction and if not satisfied we will refund your money on any purchase made.

SLIDE RULES

The Log Log Vector for the Electrical Engineer has proved a success.

We also stock the

MANNHEIM, POLYPHASE POLYPHASE DUPLEX AND LOG-LOG DUPLEX

THE NEW POLYPHASE POCKET RULE is growing more popular daily. This rule has all the scales of the large rule including cubes and cotangents. Size overall $1\frac{1}{4}$ in. wide x 6 in. long x $\frac{1}{8}$ in. thick. About the size of a pocket comb.

PORTABLE TYPEWRITERS

We are featuring a new improvement for the special TECH ENGINEERING KEYBOARD. This feature improves the efficiency about 25%.

TECH SEAL BOOK ENDS

We have recently received a shipment of these made from a new die. The seal is the best we have ever sold.

TECH SEAL PLAQUES

The seal on this plaque is made from a new die and is the best we have ever carried.

DRAWING INSTRUMENTS

Paragon and Key—Other sets can be furnished

FOR GIFTS—We Suggest

TECH SEAL JEWELRY. WATCH
CHARMS, PINS, ASH TRAYS,
POCKET KNIVES, LIGHTERS,
COMPACTS, PAPER WEIGHTS,
RINGS

TECHNOLOGY BRANCH

Harvard Cooperative Society

76 Massachusetts Avenue, Cambridge, Mass.

Gentlemen: I am interested in the article listed below. Without obligation on my part please furnish description and price of same.

Article.....

Name.....

Street.....

City.....State.....

An Unusual Display ***of*** **Summer Furniture**

is ready for your

Inspection

at

WILLIAM LEAVENS & CO., INC.

32 Canal Street, Boston

at Haymarket Square



M. I. T. MEN

H. V. Coes - - - - '06
E. S. Coldwell - - '15
S. J. Cole - - - - '26
J. A. Emery - - - - '93
Page Golsan - - - '12
J. F. Greene - - - '07
F. K. Merriman - '04
G. I. Rhodes - - - '05
A. A. Uebelacker - '18
R. P. Westerhoff - '27
H. E. Whitaker - - '09
J. E. Woodbridge '93

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THE INSTITUTE GAZETTE

(Continued from page 404)

The Commemorative Tablets

IN THE report of the committee to make recommendations on suitable inscriptions in the new dormitories mentioned last month was included the wording of the tablets to be placed in the lounge or Burton Room.

The commemorative tablets exhibit the following inscriptions:

CHARLES WARREN GOODALE '75
BUTTE, MONTANA.

A PIONEER IN THE DEVELOPMENT OF MINING IN THE WEST,
HE RETURNED TO BRING THE FRUITS OF HIS LABORS TO
THE INSTITUTE THAT TRAINED HIM

JAMES PHINNEY MUNROE '82
BOSTON, MASS.

EDUCATOR, MANUFACTURER, PUBLICIST AND WORKER
IN MANY NOBLE CAUSES.

A MEMBER OF THE CORPORATION AND LONG ITS
SECRETARY,
A DEVOTED ALUMNUS WHO RENDERED INVALUABLE SERVICE
TO HIS ALMA MATER

CHARLES HAYDEN '90
NEW YORK CITY.

BANKER, PATRON OF ARTS AND INDUSTRY.
MEMBER OF THE CORPORATION.

A FINANCIER WHOSE VISION ADVANCED
PROSPERITY, AND WHOSE UNKNOWN BENEVOLENCES
TO TECHNOLOGY AND BEYOND ITS DOORS AIDED
YOUNG MEN TO SELF-RELIANCE AND SUCCESS

ALBERT FARWELL BEMIS '93
BOSTON, MASS.

PUBLIC SPIRITED CITIZEN AND BUSINESS MAN,
ENGAGED IN MANIFOLD ACTIVITIES.
MEMBER OF THE CORPORATION.

AN ALUMNUS WITH GLOBE-ENCIRCLING INTERESTS,
YET FINDING HIS HIGHEST ENJOYMENT IN QUIET
SERVICE FOR STUDENT ADVANCEMENT AT M.I.T.

KENNETH FOSTER WOOD '94
CENTRAL FALLS, R. I.

ENGINEER, MANUFACTURER AND ADMINISTRATOR OF
THE GREAT BASIC TEXTILE INDUSTRY.
KEENLY INTERESTED IN YOUTH, HE GAVE GENEROUSLY
THAT FUTURE GENERATIONS OF STUDENTS MIGHT HAVE
LIFE MORE ABUNDANTLY

WILLIAM WRIGHT WALCOTT '01
NATICK, MASS.

SKILLFUL PHYSICIAN AND EFFICIENT
STATE HEALTH OFFICIAL.

CAPTAIN IN THE U. S. MEDICAL CORPS IN
THE WORLD WAR,
HE LOST HIS OWN LIFE IN MINISTERING TO HIS
FELLOW MEN ON THE BATTLEFIELDS
OF FRANCE

The inscription on the Burton Tablet is as follows:

BURTON ROOM
NAMED IN HONOR OF
ALFRED E. BURTON

FIRST DEAN OF THE INSTITUTE.
FOUNDER OF STUDENT GOVERNMENT AND THE
DORMITORY SYSTEM AT TECHNOLOGY.
A MAN BELOVED BY EVERY STUDENT AND ALUMNUS.

(Concluded on page 428)

Air view of mid-town New York taken from directly over The SHELTON



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THE INSTITUTE GAZETTE

(Concluded from page 426)

The general dedication tablet is as follows:

DEDICATED
IN GRATEFUL APPRECIATION
TO
THE ALUMNI
OF THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
WHOSE GENEROUS CONTRIBUTIONS
MADE POSSIBLE
DURING THE PRESIDENCY OF SAMUEL WESLEY STRATTON
THE PROVISION OF THIS QUADRANGLE,
THAT STUDENTS MIGHT HAVE
COMFORTS AND CONVENIENCES IN THEIR WORK,
A BROADER SOCIAL CONTACT
IN THE COMPANIONSHIP OF THEIR FELLOWS,
AND A LARGER SHARE IN THE
UNDERGRADUATE LIFE
OF THE
STUDENT BODY.

11,000 TONS ON WHEELS

(Concluded from page 401)

to the column. The space between the column base and the previously placed grillage was then grouted, and allowed to set for three days during which time four jacks supported the column load. One of the popular brands of quick setting cements was used for the grout. With the columns supported on their new footings, the basement walls, floors and partitions were reconstructed and the various house services and telephone cables restored to a permanent condition.

During the entire moving operation there was never any indication of nervousness on the part of the Telephone Company's employees, nor was it possible to detect a feeling of motion while standing on one of the upper floors of the building. Another interesting feature was the fact that most of the "tell-tale" paper strips placed across the plaster cracks throughout the building before the first column was lifted, were still intact and held by the plaster at the end of the operation. The word "most" has been used advisedly, since during the first lifting operation the men were a bit anxious and over-jacked several columns. One of these columns was lifted $\frac{3}{4}$ inch which naturally caused cracks to open in the plaster, these, however, closing again when the column rested on the rollers.

Perhaps the finest compliment the job could receive was that expressed by Mr. Vance Oathout, chief engineer of the Indiana Bell Telephone Company: "The building had been moved as planned, placed on the exact spot indicated, within the time schedules, within the cost estimates, without interruption to service, and without a mishap."

The work was under the supervision of Mr. Oathout and Mr. E. B. Webb, Building and Equipment Engineer, with the aid of Vonnegut, Bohn and Mueller, Architects; Voorhees, Gmelin and Walker, Consulting Architects, H. G. Balcom, Moran and Proctor, and Bevington-Williams, Inc., Consulting Engineers. The General Contractor was Leslie Colvin of Indianapolis and the sub-contractor for the structural steel and moving operation was John Eichley, Jr. Company, of Pittsburgh, Pa.



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PERSONNEL

THE Division maintains a list of graduates, with records of their experience and special qualifications for engineering and technical work. A list is kept of positions open.

Alumni are urged to report promptly changes of address, or changes of business connections. Officers of local Technology Clubs and Class Secretaries are urged to acquaint the Department with information which may come to their notice of Alumni interested to make new connections, or of positions open.

Address communications to Personnel Department.

DIVISION OF INDUSTRIAL COÖPERATION & RESEARCH

MASSACHUSETTS INSTITUTE *of* TECHNOLOGY • CAMBRIDGE



ADVERSARIA



A Note on John R. Freeman

¶ At a meeting of the American Society of Civil Engineers in January, at which JOHN R. FREEMAN '76 was elected to an honorary membership, his engineering achievements were praised in addresses made by Mr. Charles R. Main '76, and Mr. C. E. Grunsky. Following are some excerpts from these speeches: "... After a varied experience as consulting engineer on water power and mill construction problems, Mr. Freeman made, for the Finance Department of New York, an exhaustive study of available water supply, submitting results of these studies in a comprehensive report which at once marked him as one of the foremost hydraulic engineers in the United States. ... He was a consultant on the locks and dams of the Panama Canal, was called to China on problems relating to the Grand Canal, and beyond our borders to the North he served the Canadian Government as consulting engineer on water power conservation. ... Mr. Freeman revisited the European hydraulic laboratories a number of times and inspired and edited the publication of a comprehensive volume of more than 800 large-sized pages on 'Hydraulic Laboratory Practice in Europe and America.' He was untiring in his efforts to direct attention to the need of such a laboratory in the United States, and he stimulated interest by endowing travel scholarships under which this Society sent a number of young engineers abroad for study and experience at the best-equipped European laboratories. These efforts have borne fruit, and under authority of and with funds provided by Congress, under the leadership of Mr. Freeman as one of the consultant engineers, there is now about to be erected at the Bureau of Standards, a National Hydraulic Laboratory, to which any member of our profession may bring his problem if its solution is worth while." Mr. Freeman is also a member of the National Academy of Sciences.

Honored

¶ OTTO G. C. DAHL '21, by being awarded one of the two fellowships granted to engineers by the John Simon Guggenheim Foundation.

Appointed

¶ GEORGE A. RICKER '86, Industrial Consultant to the National Capital Park and Planning Commission.

¶ HENRY H. CLARK '98, to become director of the Cleveland School of Art.

¶ JOHN W. NICKERSON '09, a member of the Professional Divisions Executive Committee on Management of the American Society of Mechanical Engineers.

¶ ERNEST M. SYMMES '11, Chairman of the Delaware section of the American Chemical Society for 1931.

¶ IRVING W. WILSON '11, one of the Vice-Presidents of the Aluminum Company of America.

¶ GEORGE E. WHITWELL '15, Vice-President in charge of sales of the Philadelphia Electric Company.

Spoke

KARL T. COMPTON, on March 2, over the radio, given under the auspices of the Department of Education of the State of Massachusetts. His subject was "Engineering — A Profession."

Attended

¶ By WILLIAM HOVGGAARD, of the Department of Marine Engineering and Naval Architecture, the conference of the Institution of Naval Architects at London, March 25-27. Professor Hovgaard's paper will deal, in part, with the strengthening of deck structures and the elimination of stresses, making unnecessary expansion joints now in use.

Designed

¶ By ROGER L. NOWLAND '27, a new type of airplane. A scale model of the plane has been made and tested in the wind tunnels of Curtiss-Wright and the Department of Commerce. Aviation experts have hailed his invention as a great stride in the development of stream lines, having the shape of a falling drop of water, which is claimed by aircraft designers to be the ultimate in stream line design.

The ship, which is about half completed, is a high-wing cabin monoplane somewhat similar to the Northrup "flying wing." There is no fuselage in the usual interpretation of the term. The tail assembly is attached to booms with cable controls enclosed in grooves on each of the two booms. The cabin is in cello glass and aluminum, with vision in every direction but the rear. It is built strong enough, Mr. Nowland claims, so that if the plane should nose over in landing, it would not crumple. The cell will be fire-proof in construction. The plane is a pusher type, and the propeller revolves between the two booms. It is expected that the plane will have a top speed of 120 miles an hour, and a landing speed of between 22 and 23 miles an hour. The plane will be built to sell for \$2,000 to \$2,500.

Kidnapped

¶ HUGH M. CRAIGIE '24, by Mexican bandits in Santa Barbara, Chihuahua, about 350 miles south of El Paso, Texas.

It was the first affair of that nature since the revolutionary days of 1916. Federal mounted troops were sent after the kidnappers but Craigie escaped from the mountainous rendezvous before their arrival.

Deaths

¶ Reports have come to The Review since the last issue of the decease of the following:

¶ HARRY T. BUTTOLPH '76, on March 13. For many years he was in the Division of Engineering on the Board of Public Works in Buffalo, N. Y.

¶ WILFRED BARNES '77, on January 26. He was connected with various paper mills and was very active in this work until he retired at the age of 72.

¶ HENRY I. COBB '80, on March 27, in New York City.

¶ JOHN H. ROSS '82, on March 12, in Bermuda. For many years he was general manager of the Linen Thread Company, Inc., of Jamaica Plain, Mass., but retired 10 years ago. He remained a director of the Linen Thread Company of Great Britain, the Mercantile Wharf Corporation of Boston, and several private and welfare organizations.

¶ EDMUND W. KINGSBURY '83, on January 23, in Framingham, Mass. Mr. Kingsbury specialized in architecture until 1905 and since then he devoted his time to painting.

¶ LOUIS H. OLZENDAM '89, some time in February, in Passaic, N. J., following an emergency operation.

¶ WILLIAM B. PAGE '93, on March 15, at Fitchburg, Mass. He was associated for many years with the George W. Wheelwright Paper Company, and was very prominent in the business and social life of Fitchburg.

¶ FREDERIC E. FOYE '00, on March 22, in West Bridgewater, Mass. Mr. Foye was well known in the shoe trade in both West Bridgewater and Brockton.

¶ ARTHUR M. COLEMAN '12, on March 12, in Cleveland.

¶ ELLIOT H. GAGE '13, on July 14, 1930, in Chicago.

¶ EDWARD F. BRENNAN '22, recently in Guilford, Maine.

¶ CLINTON F. SMITH '22, on March 11, at the Genesee Hospital in Rochester, N. Y., following an attack of pneumonia. He was sales manager of the General Plate Company of Attleboro, Mass.

¶ RICHARD F. KENEFICK '24, on July 30, 1930, in Toledo, Ohio.

¶ DELBERT M. CROSS '26, on January 24, in Toronto. The cause of his death was a fractured skull and brain hemorrhages caused by a fall on skis.

¶ THOMAS F. KENNEY, lecturer in Biology and Public Health at Technology 1924-25, on March 15, in Boston.

NEWS FROM THE CLASSES AND CLUBS

1875

At the Annual Alumni Dinner held at the Hotel Statler, Boston, Tom and Mrs. Hibbard, Edgar and Mrs. Dorr, and Joseph Homer represented the Class. This was the largest showing of any of the old classes, over 50 years since graduation. I was sorry indeed not to have been present, more particularly after receiving Hibbard's letter enclosing the account from the Sunday *Herald*.

While I missed out enjoying the Alumni Dinner, I had the pleasure of representing '75 at the Annual Dinner of the Washington Society of the M. I. T., held about the same time. Other than in Boston, at not any Technology meeting in the last three years have I encountered a member of a class earlier than '75 except in Minneapolis, where Hazen James Burton '70, is the much beloved dean. In my trips to and from the North Pacific, we have gotten together on the days before the Boston fire. Burton was a member of the historic Lowell Baseball Club, which in conjunction with the Athletics of Philadelphia, created the great American game as known around the world. Prior to 1869 each town, school, or college had its own rules, the distance between the bases was governed by the contour of the ground and the ball was of varying size to suit the whim of the players. But this is a digression. Here in Washington next to the class of '75 comes '84, which is represented by President Tyler, who presided at the annual dinner aforesaid, to the general acclaim. The speaker guest of the evening was Rev. Dr. Goodwin of William and Mary College, of which William Barton Rogers was an alumnus. He told most interestingly of the rebuilding of old Williamsburg now in progress to be restored as it was in the stirring Colonial era, when it was the capital of Virginia "when George courted Martha."

Following Dr. Goodwin, President Tyler spoke reminiscently and delightfully of the early years of the Institute, of the far seeing planning of William Barton Rogers to create a foremost Technology school to supply a need in the upbuilding of the country and the fulfillment of his dream as the years follow one the other. The fine new science building at William and Mary College is named for William Barton Rogers and the Institute has a binding tie to this reawakened Virginia seat of learning which is growing by leaps and bounds. The exceedingly felicitous occasion was concluded by dancing and voicing the unique success of the evening with the promise of meeting again next year.

As Secretary Joseph Y. Houghton '26 tells it, the Washington Society of the M. I. T. started the 1931 season off with a bang! This was evidenced first by electing Dr. Harry W. Tyler '84 President, then in

organizing an executive group of the most active members for the purpose of making this the best year in the history of the society. The annual dinner was a good start and the promise is that the speakers at the luncheons will be men eminently qualified to present timely topics in a way to appeal and interest. This promise was admirably accomplished at the first luncheon following the annual dinner. The speaker was Secretary John P. Gregg of the American Section of the International Chamber of Commerce, who gave an enlightening digest of what this organization has accomplished in the eight years since it was organized. The foremost business men in the 27 leading countries compose the membership. There have been six general meetings held in European capitals and in Tokyo. The next meeting, the first in the United States, when will be assembled the most notable captains of industry of the world, will be in Washington, D. C., May 4-9, 1931, to discuss economic conditions of the different countries in the endeavor to point a way toward stabilization and betterment. Among the topics in the agenda will be tariffs, dumping products, mass production and the plight of silver as basic money. While these are paramount tangled and involved questions and the foreign policy of each nation is devoted primarily to its own interest, the speaker expressed himself as hopeful that benefit of wide extent will result from this give and take exchange of views. These meetings will be open to the public and undoubtedly the papers will give adequate reports of them.

Conforming to the instructions of the class at the last annual meeting at the Engineers Club, Boston, the President and Secretary have taken steps to have a clock installed in the Lounge of the new dormitory, the gift of '75. This is not strictly true for the President has seen to all the details while the Secretary from a distance has lent appreciative approval. Thank you, Tom. Mr. Carlson of Coolidge and Carlson, the Institute architects, has the matter in hand and it is understood that the clock will be in place before the summer vacation. It will be recalled that Charles W. Goodale bequeathed \$50,000 to the Institute preferably to be placed in the Dormitory Fund. It is of interest that the section where the Lounge is located has been named Goodale and it is becomingly appropriate that this timepiece, in memory of his class, should be placed here. None felt or knew the need of dormitories more than Goodale. In the years before his graduation he came each day to the Rogers Building on Boylston Street from the family home in Reading.

Under date of March 11, classmate Bush writes from St. Louis: "A few days after receiving your letter with the ac-

count of the annual dinner, I was unfortunate enough in alighting from a street car to be knocked down by the front door, which extended out from the step 10 inches. The motor man started the car before I was in the clear and I was thrown down violently to the concrete platform so that I was laid up 10 days, but I am O. K. again. On March 1, I was retired from my position as drainage engineer of the Wabash Railway and the office was abolished. I must get in the harness again, for I do not like being idle." So far as heard from he is the only '75 man who has not gone on the retired list willingly.

Will Prentiss writes from Wilbur by-the-Sea, Florida: "This place is so very quiet that we begin to feel almost as much out of the world as if we were on a desert island. However, it has been a good place for me to recover from the horrible nightmare of the shingles, which took quite a lot out of me. I am still some 10 pounds short weight, but beginning to feel more like myself, as I enjoy today's summer weather. We have had a very unusual winter in that it has been dark and cold most of the time." Will and Mrs. Prentiss plan to return to Holyoke by the first of May. Speaking of climate Washington has had an unusually appealing winter, with less than six inches snowfall and no severe cold days, while North Carolina has had two feet of snow and bad storms on all sides, and for the most part bright days held sway in the District of Columbia.

Tom and Mrs. Hibbard passed through Washington on March 28 on their way to Florida to visit their son. I met him at the Union station for a twenty minutes' talk. Sorry they could not tarry for a day at least for me to play Cicerone. They were to return to Milton, Mass., in about three weeks.

When this number of *The Review* appears I am booked to be in Brookline to remain in and around Boston to the middle of May. Should all go favorably, I expect to start for Puget Soundland soon as the summer tourist tickets are available, going via New York, Washington, Cincinnati, Chicago, Minneapolis, Butte, Spokane, and Seattle, making stops at each place. Side trips are allowable to Portland, Victoria, and Vancouver. During July and August letters will find me at College Club, Seattle, Wash. There is no climate in summer more joyfully delectable than that of the North Pacific. — HENRY L. J. WARREN, Secretary, 4700 Langdrum Lane, Chevy Chase, Md.

1876

Your Secretary regrets to have to record the death of another of our members, Harry Tracy Buttolph. His brother, Benjamin, tells me that Harry, while rather frail, had been going to the office up to the Saturday previous to his death,

1876 Continued

when he developed a cold which turned into what the doctors call a pneumonic condition. He died on March 13, and the funeral was held in Buffalo on March 16.

Harry combined uncommon ability with modesty in a remarkable degree. I am told that years ago and on many occasions he practically declined being made chief engineer of the City of Buffalo, preferring to remain at the head of the construction department devoted principally to street building and maintenance. He told me once, years ago, that he was as high as he could go without getting into the thick of political work, and that he preferred to remain with engineering work.

Many years ago in the early days of asphalt pavements, he was put in charge of their introduction in Buffalo, and I think at one time Buffalo had more miles of first-class asphalt pavement than any other city in the country. This was before the days of the modern concrete road building. I have heard of the high esteem in which he was held by citizens, by city officials, and by contractors, for his absolute fairness and his inflexibility, honesty of purpose, and the earnestness with which he discharged his duties toward the city. Because of the high esteem in which he was held, he has been continued long beyond the normal 70-year age for retirement.

Harry was born in Vermont, of a fine old colonial line, but removed early to Buffalo, from whence he came to the Institute and to which city he returned after graduation, and where he has spent his entire business life. The ranks of the Class of '76 are thinning fast, and it is particularly hard to take leave of such a fine, steadfast character as Harry Buttolph.

His younger brother, Benjamin Buttolph, has been associated with the writer many years, first as an assistant engineer, and for many years past as Vice-President of the Manufacturers Mutual Fire Insurance Company, and through him I have maintained a sort of intermittent contact with Harry. Harry married 36 years ago, and his wife survives him. They have no children. — JOHN R. FREEMAN, *Secretary*, 815 Grosvenor Building, Providence, R. I.

1877

The Secretary presents herewith a brief biographical sketch of Wilfred Barnes who died on January 26, 1931. He was born in Portland, Maine, September 17, 1849. He entered Cornell University in the Class of 1873 but on account of the death of his father in 1871 he did not return to Cornell but entered the Class of 1877 at Technology.

From the Institute he went to work in the paper mill of S. D. Warren at Westbrook, Maine, and was sent by this company to their mill in Yarmouth, Maine, where he was superintendent from December, 1876 to December, 1880. For 11 years he was a member of the board of directors of the North Yarmouth Academy. From March, 1881 to March, 1882 he was manager of the California Pulp and Paper Company in Stockton, Calif. From April,

1882 to December, 1883 he was connected with the Bacon Paper Company in Boston and the Foust Fiber Company of Berlin, N. H. in Boston.

He was with the Penobscot Chemical Fiber Company near Bangor, Maine, as manager from December 1883 to December, 1884. He was manager of the Westmoreland Paper Company of West Newton, Pa., from March 1888 to December, 1891. From March, 1892, to March, 1893, he was manager of the Puget Sound Pulp and Paper Company in Everett, Wash. He was manager of the Otis Fall Pulp and Paper of Livermore Falls, Maine from April, 1893 to July, 1894. From then to 1921 he was in Boston on general engineering work and similar problems. He retired from active work at 72 years of age.

He married Maria E. Whiton in Cambridge, July 9, 1878. There were four children — Wilfred Barnes, Jr., now of Philadelphia; Clara Barnes of Melrose, Mass.; Marion Barnes of Melrose, Mass.; and Phineas Barnes of Malden, Mass. Wilfred Barnes, Jr., has a son Wilfred Barnes, III; Phineas Barnes has five children. After retiring, Jr. Barnes spent the most of his time on literary work. His family think he would have been more successful if he had been a literary man instead of a manufacturer.

Following is the second installment of the account of Henry D. Hibbard's world tour:

Manchuria, November 20 to 24

"The second day the men of the party visited the Fushun colliery, one hour's ride east of Mukden. The coal seam, by far the thickest known on earth, extends only ten miles along the strike, but its thickness varies from 36 feet at the western end to 450 feet on the eastern. The seam pitches to the south perhaps 30°. The outcrop is worked from an open pit 600 feet deep and 3,000 yards long. Some of the coal in the open cut is dug by steam shovels in terraces. There are also shafts from which the seam is worked in depth, the output from all operations being 25,000 tons of coal per day. An additional strip of the overburden is being removed to allow more coal to be won in the open pit.

"Geologically the coal is young, of Tertiary age and rather soft, but it is quite black in color. A feature of the seam is the presence of amber, which is quite common; and the better pieces are made up into crude jewelry and other articles which are offered for sale. An occasional piece contains an insect.

Overlying the coal is a bed of oil shale over 400 feet thick, which is being worked for its hydrocarbon contents, in a plant having a capacity of 3,000 tons per day. The shale contains 6 % of volatile matter, mostly oil, and 10 % of fixed carbon, leaving 84 % of incombustible matter or ash." — BELVIN T. WILLISTON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

1883

Harvey S. Chase and Mrs. Chase are stopping at St. Petersburg, Fla., where they have been spending a wet, disagree-

able winter. Harvey Chase has just sent me a letter from Mrs. E. Winchester Kingsbury, announcing the death of her husband on January 23, in Framingham, Mass. Those of us who attended the Class reunion at Hyannisport, will remember how much we enjoyed having the Kingsburys with us. Kingsbury was not graduated with us, but we will miss him in our class reunions just the same.

Edmund Winchester Kingsbury did not graduate with the Class of 1883 but was one of its members. He specialized in architecture until 1905, since which time he has been working at his painting — mostly water color landscapes, which work he enjoyed hugely. His parents were George Henry and Marion Winchester Kingsbury, and his grandfather was Henry Kingsbury, a shipbuilder of Kennebunk, Maine. Many of his ship models are in possession of the Institute. — DAVID WESSON, *Secretary*, 111 South Mountain Avenue, Montclair, N. J.

1887

President Taintor, who with Mrs. Taintor, is enjoying a six months' trip abroad, writes very interestingly of their travels in Greece, Italy, and other countries which they have visited. After leaving Greece on January 21 on the *S. S. Saturnia* of the Cosulich Line they made a brief stop at Trieste, going from there to Rome, where they spent three weeks. At the time of his last writing he was stopping for three weeks at Taormina, from which he will visit Capri for five days and from there will go to Florence for ten days, thence for a brief stop at the Italian lakes, after which he will spend a few days in Paris. From Paris they will journey to Brittany, from which place after a stay of three weeks they will start for home via Cherbourg, arriving in the United States.

It is the painful duty of the Secretary to announce the passing of another of our classmates, Oren S. Hussey, who died in Bradenton, Fla., on February 8. One of the most genial and kindly of men, Hussey has always held a high place in the esteem and affection of his Class, as well as his friends and associates in all walks of life. His loss is indeed a sad one to all with whom he came in contact. The following is from the *Boston Transcript*:

"Oren S. Hussey, a well-known retired business man and engineer, resident of Nashua, N. H., died in Bradenton, Fla., his winter home, on February 8. The funeral was held at Nashua, February 11, at 1:30 P. M., and was private. He was born in Nashua in 1865, and was graduated from the Massachusetts Institute of Technology as a mechanical engineer. For some years thereafter, he worked with Thomas A. Edison and was a member of the famous Edison Pioneers, an association of men who were intimately connected with Edison during the early years of his work.

"During his business career, he had been one of the division managers of the old Thompson-Houston Company, now the General Electric Company in Boston. He was also treasurer of the Frank Ridlon

1887 Continued

Company, and a member of the firm of Gregg and Son in Nashua. During the World War, he held a prominent civilian position in the Ordnance Division of the War Department. He was a member of the American Society of Mechanical Engineers and the University Club. He is survived by his widow and a brother, residing in Nashua." — EDWARD G. THOMAS, Secretary, 1940 Calumet Avenue, Toledo, Ohio. NATHANIEL T. VERY, Assistant Secretary, 96 Bridge Street, Salem, Mass.

1889

The Annual Dinner for 1931 was held at the Union Club on the evening of Tuesday, March 10. The following were present: Bridges, Edward French, Gleason, Hunt, Kilham, Kunhardt, Laws, Lewis, Loring, Mildram, William Smith, Spaulding, Thurber, and Underhill. The "farm dinner" which was ordered and served, somewhat to the consternation of the Union Club's dignified staff, met with so hearty approval that a demand was expressed for another luncheon in June of this year and a motion to that effect was passed unanimously according to the President who stated that he never counted votes.

The following were also present at the Alumni Dinner on February 28: Edward French and Mrs. French, Hunt and Mrs. Hunt, Kunhardt and Miss Katherine Kunhardt, Laws and Mrs. Laws, Hart, Hobbs, and Kilham. — William H. Dow is President of the Portland (Maine) Society of Natural History. — Zenas Bliss, now State Tax Commissioner of Rhode Island, has been appointed one of the permanent receivers of the Manville-Jenckes Company pending reorganization.

Mechanical Engineering for March, 1931, contains a very interesting article by George Orrok on "The Boiler Room of the Future." Orrok foresees that all solid fuel for the making of heat in the future will be burned in a gaseous state and also the development of large capacity boilers of small size using high speeds and high heat transfer rates.

According to the Boston *Traveler* of March 9, Bixby has in Baldwin, N. Y., the largest nut farm in the world. He has between 300 and 400 assortments. Bixby says he is "taming wild nuts" and has found that only by grafting the twig from the producing tree on the limb of another can nuts be produced. He says a nut cannot be planted and a producer raised.

A letter from Bosworth, whose address is 198 Avenue Victor Hugo, Paris, reads as follows: "I noted with much sympathetic appreciation, that the Class Pin is now the Safety Pin! Perhaps I am better able to understand the true beauty of the 'Safety Pin' just now, than any other member of the Class as my youngest daughter will be only nine months old this month! I think I have neglected to inform you of the birth of Miss Audrey Veronica Bosworth, on June 20, 1930! Françoise, the elder sister, is now talking glibly in both French and English, and no longer seems anything of a baby! It would interest me very much to know who is the next oldest child of the Class,

so to speak, and what his (or her) age may be. I haven't heard from Frank Hart for a long time, I hope he is like his old self."

The Rotogravure Section recently contained a fine picture of E. V. Shepard, our noted bridge authority, looking on at a game of chess at the Contract Bridge Club in New York. — The Secretary has received word of the death of Louis Olzendam at the General Hospital, Passaic, N. J., following an emergency operation, about February 2. — Juddy Wales, who has been undergoing a series of operations, is very much better and expects to be present at the Reunion in June. — George Alley, who has had much the same experience, is also practically all right again. — WALTER H. KILHAM, Secretary, 9 Park Street, Boston, Mass.

1891

The usual mid-winter Class Dinner was held at the Algonquin Club, Boston, on Monday evening, February 2. President Karl T. Compton was the guest of honor. Gorham Dana, Arthur Hatch, and Harry Young were the Committee in charge and there were 26 members present, as follows: Alley, Barnes, Bassett, Blanchard, Brown, Colburn, Capen, Clark, Dana, Douglass, Fiske, Forbes, Fuller, Hatch, Hawley, George and Francis Holmes, Howard, Howland, Mansfield, Marquand, Smith, Swan, Tyler, Wilder, and Young.

We were especially glad to welcome Hawley and Marquand, whom most of us had not seen for a long time. Arthur Alley is in Boston temporarily on account of his brother who has been seriously ill, but is now improving. Replies were received from about 45 members who could not attend. We greatly missed Billy Bryant, who always came to our dinners. He was the only one of our members who died since our last dinner. — We greatly appreciated having President Compton with us. Most of us had never met him and we hope he enjoyed seeing us as much as we did meeting him. He gave us an interesting talk on Tech affairs, new lines of work, and recent developments. In the absence of President Bradlee, who was not feeling just right and thought he had better stay home, the Secretary officiated. He also reported for the Treasurer, showing that we have a good balance to cover incidental expenses in connection with getting ready for our Fortieth Reunion in June.

The Secretary reported that we have made reservations at East Bay Lodge, Wianno, Mass., for June 12 to 14. This is where we went on our Thirty-Fifth Reunion and it proved so satisfactory that everyone was in favor of going there again. Committees were appointed to take charge of Reunion affairs. — Barney Capen was nominated and unanimously elected Assistant Secretary of the Class. Information, letters, or notes for *The Technology Review* can be sent to Barney or to the Secretary. — Gorham Dana told us about proposed changes in the Alumni Council. Arthur Hatch told us about naming the dormitories and as they

do not propose to name floors or separate rooms, it is not likely that '91 will appear in the names to be selected for the various units.

Will Bassett gave us an interesting account of his visit to some of the universities and technical schools in the West and on the Coast. He had a nice visit with Professor Hersam '91, University of California, and also saw our old friend, Dr. Noyes, now with California Technology. — Ellie Bird made a sketch for the menu, which was very attractive. We will ask Ellie to help us out on posters, programs, and so on, for the Fortieth Reunion. — Morris Knowles has been asked by President Hoover to serve as Chairman of his Committee on Utility Developments in connection with his Conference on Home Building and Home Ownership. — Jim Swan has left the New England Steamship Company and will shortly move from Newport to New York City where he will have charge of the New York Office of the New York Ship Building Company. We had lunch together in Providence recently.

George Spooner writes from Newark: "We are all very well at home. In August, Howard presented me with my first grandchild, a little girl, who of course was very welcome. Marjory spent the months of July and August on a European trip with several of her college classmates and had a very pleasant and instructive trip. Howard is still with the Public Service Company doing electrical work. Marjory is with the West India Oil Company (Standard subsidiary) in Newark and has a very nice position. I am still plugging along in this office (Superintendent, Sprinklered Risk Dept., Schedule Rating Office of N. J.) where I have been for 17 years. I have lost both my aunts in New Bedford (one a year ago and the other in November) so I am now the oldest member of the family. Still in good health and going strong."

Charlie Aiken leaves Sydney for Vancouver on April 7, stopping off at New Zealand and Honolulu, and then going to Seattle, Portland, San Francisco, and Los Angeles. He will look up Leland, Hooper, Shattuck, Garrison, and so on, and round up a delegation for our Fortieth Reunion. We are counting on George Hooper and hope others can make it. In a recent letter Charlie speaks of going to Brisbane and running into rains and flood after a long dry season. Thirteen and one-half inches in one day (sounds like the deluge) and had to return by boat (land or ocean boat not stated). Looks as if he would not reach Boston much before June 1.

Postals from Steve Bowen from the Pacific Coast mention dining with Hooper and Garrison. Steve is coming back via the Panama Canal. — Letter from F. Clouston Moore says he expects to attend the Reunion. His boys are through college so he doesn't come East very often. He saw Charlie Wood in Albany; Charlie has a son, Johnny, who is a Tech Freshman. It seems that Barry Wood, the Harvard athlete, is Charlie's nephew. — What a fine trio we had in the three Moores, how loyal they all were to '91, and how much

1891 Continued

they enjoyed our reunions. Two of them have gone since the Thirty-Fifth and we will miss them. Here's hoping nothing will prevent our Fred from being with us at Wianno. We have thought of him as F. Clouston for so many years, but I suppose no one outside of '91 even knows his middle name. — Gif Thompson, our world traveler and lecturer, wrote Barney about a lecture which he recently gave on "Famous Rivers of the World" which included the Mississippi, Rhine, Ganges, Yukon, and Nile. Covers some territory, what! The Secretary has only seen two of them but has hopes. Our Committee on Entertainment should enroll Gif on our Reunion Program.

Fred Rose wrote Barney from Miami, where he was recuperating. He says they have had it cool and rainy and poor business in Florida. He says that he hopes to attend the Reunion and we hope he can make it. Most of us haven't seen you for a long time, Fred. — Charles Garrison's mother passed on this winter. The following is from a letter from Long Beach, written in February, and should have been read up north at that time of year to be fully appreciated. "Last week we took a day's run to the mountainous region about Banning, not very far from Forrest's skating rink. The almond and prune trees were in bloom but the cherry trees refused to celebrate Washington's birthday. I suppose that they felt too cut up when they remembered George's past and what he had done to an innocent member of their family. Anyway, we are going again when they don't feel so peeved, as we want to see them in full bloom. We passed through the orange country where lemons and oranges filled the trees. We eat about half a dozen a day, some in juice and some cut up. They are 10 to 15¢ a dozen for medium sized ones. Peas, 10 to 15¢ a pound, are now good and I saw the first strawberries a few days ago. We have bought no meat since we have been here and prefer the fruits and vegetables."

A letter from Philip Marquand tells about his poultry farm at Newburyport. We all enjoyed seeing him again at our Class Dinner. "I am very busy with my chickens now. Saturday I hatched 496, which, added to what I have for myself, now make 1,035. I will keep some 500 more. Besides this, I have sold 2,500. I will probably see you at the Fortieth celebration if I can possibly get away." — Will Wilder has recently returned from a boat trip to Cuba, Panama, and so on, and sent me the following very interesting letter. "Mrs. Wilder and I returned a few days ago from a cruise on the *S. S. Kungsholm*, and on the return trip stopped two days at Havana. While at the dock, the ship was provided with a telephone connection, and Sunday noon I called Charlie Ricker's house. Thanks to a dial system, I did not have to make connections through a Spanish speaking operator. Charlie answered the phone and when informed that Mrs. Wilder and I were in Havana, said, 'This is a regular '91 day, and who else do you suppose is here?' Of course I didn't know, but Charlie informed me

that Morris and Mrs. Knowles were on the *Britannic* which docked a few hours ahead of us, and stated, 'We are all going out to the Country Club for tea and a '91 reunion;' so a little later Charlie and Mrs. Ricker came down to the dock, and after they had inspected the *Kungsholm*, we proceeded to the *Britannic*, where Morris and Mrs. Knowles were waiting for us. Then we drove out to the Havana Country Club, and you know what a delightful drive this is. Ricker is a charter member of the Country Club, located on what was formerly an old plantation. Years ago this was acquired by a group of English speaking residents of Havana, and the old plantation house was gradually converted into the present attractive club house. Had time permitted, I should have enjoyed a round of golf on the really beautiful course. Tea was served out of doors, and all in all, three '91 boys and their wives had a delightful and long-to-be-remembered reunion. Later in the evening we returned to the city and the following morning sailed for home. I was delighted to find Morris Knowles looking and feeling so well, for as you know, he has been through a serious illness. Charlie and Mrs. Ricker are charming hosts, and I believe the ladies of our party enjoyed the reunion almost, if not quite, as much as their husbands. By the way, Ricker is very anxious to attend the Reunion and will do so if he can possibly arrange it.

"The *Kungsholm* returned home directly from Havana, but Morris and Mrs. Knowles planned to leave the *Britannic* at Nassau, cross over to Miami, and from there work north, by automobile, to arrive home about the first of May. Our own cruise included Porto Rico, Caracas, the capital of Venezuela, Curacao, Colon, Panama, Jamaica, and Havana, as already mentioned. We had a pleasant and restful trip, but not the least interesting of our experiences was the '91 reunion at Havana." — HENRY A. FISKE, *Secretary*, Grinnell Company, 260 West Exchange Street, Providence, R. I. BARNARD CAPEN, *Assistant Secretary*, The Early Convalescent Home, Cohasset, Mass.

1893

William Brewster Page died at Fitchburg, Mass., on Sunday evening, March 15, after 15 months of suffering from cancer. In December, 1929, he underwent an operation at the Phillips House, Boston, at which time it was feared we would lose him, but from which he rallied to such extent that he was able to attend the Class Dinner at Marblehead Neck on June 6, 1930, during the Technology Reunion festivities. Fred Dillon writes: "I had quite a chat with him Sunday noon (the day he died) and while he was physically weak, his mind was clear." Funeral services were held on March 18 at Christ Episcopal Church in Fitchburg.

From the days of our freshman military drill, when he filled the prominent position of fifer in our incomparable drum corps, of which Harold Mott-Smith was drum-major, every '93 man has fond and

lively recollections of Billy Page. Endowed with charming good nature and a droll humor, he was among the best liked men in the class and one who made friends and kept them loyally. He was one of the "Fitchburg quartette" to enter '93, the others being Fred and Ben Dillon and Rob Wallis. Of these, Ben Dillon died in 1909 and Wallis in 1924. Upon leaving the Institute at the close of the sophomore year, in June, 1891, Billy Page became connected with the George W. Wheelwright Paper Company of Fitchburg, in which his father was active, and in which company he served for many years in various capacities from clerk to agent and treasurer at its plants in Wheelwright, Leominster, and Fitchburg. He long resided in Fitchburg at 124 Summer Street, later at 15 Prince Street, and for a time was active in public and political affairs of that city. He was born in Fitchburg on June 8, 1870. He married, December 10, 1902, Miss Mary H. Huse of Newburyport, who died some years later. He married again on November 27, 1918, Miss Dorothy J. Beeber of West Chester, Pa., who, with their daughter Barbara, survives him.

The members of the class, with the single exception of Bemis himself, enthusiastically endorse the action of the Alumni Committee in renaming the '93 dormitory unit in honor of Albert Farwell Bemis. This is in keeping with the policy of naming all six units of the new dormitory group, of which the '93 unit was the first, in honor of alumni who have been especially active in this movement for the betterment of undergraduate life. We well remember the Thirtieth Anniversary Dinner at the Wianno Club, Cape Cod, on June 9, 1923, at which the important item of business was the announcement by President Fabian of the underwriting by a "few" members, in the name and in behalf of the Class, of a fund of \$100,000 as our Thirtieth Anniversary gift to the Institute, to be used for the building of a dormitory. The "few" anonymous underwriters were later found to be Bemis, himself. While a substantial proportion of the Class contributed in varying amounts to the Dormitory Fund inaugurated that evening, it was Bemis who actually contributed the lion's share of the fund. Although known to only one or two at the time and they enjoined to strictest secrecy, it was Bemis who had conceived the idea of this pioneer dormitory gift to Technology, the culmination of long and intensive study by him of the problem of student housing which then was such a pressing need. In this direction Bemis did notable pioneer work. To him, perhaps more than to any other alumnus, Technology is indebted for the awakening of interest in the dormitory problem which has been productive of such fruitful results.

Concerning the bi-monthly Class luncheon in New York on January 30, Jim Emery writes the Secretary: "At our luncheon on Friday there was unanimous and very enthusiastic approval of the proposal to change the name of the '93 dormitory to Bemis. There were present

1893 Continued

Blood, Allen, Latey, Whiston, Thomas, and Emery. Your letter and greeting were very much appreciated."

Mrs. Edward Page, wife of our classmate who is President of the New England Coal and Coke Company, sailed from Vancouver on February 28, on the steamship *Empress of Japan* for an extended stay in the Orient and particularly to visit her son, Edward Page, Jr., who was appointed by the President to the United States diplomatic service early in 1930. Her itinerary included two weeks in Japan, where last year her son was stationed for a time as third secretary at the embassy. Mrs. Page then planned to join her son in Peiping, China. After spending some time in China, Mrs. Page will go to Harbin, Manchuria, where Edward, Jr., is stationed as Vice-consul.

On Saturday, March 21, the *Transcript* carried this brief news item, which is of much interest to the class: "Mr. and Mrs. Frank Ames Niles of 39 Fifth Avenue, New York City, announce the engagement of their sister, Miss Mary Washburn Pearson, to Charles Milton Spofford of Brookline." — FREDERIC H. FAY, *Secretary*, 44 School Street, Boston, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, P. O. Box 1604, Boston, Mass.

1895

The Class of 1895 was well represented at the Alumni Dinner held at the Hotel Statler, Boston, on Saturday evening February 28. There was a total of 19 at the two tables reserved for the Class. At one of the tables were Franklin A. Park and Mrs. Luther K. Yoder, Henry D. Jackson and Mrs. Jackson, Franklin A. Park, Jr., and Miss Lucile Defren, Luther K. Yoder and Miss Marjorie Park, and Gustavus Clapp. The other table included Thomas B. Booth and Mrs. Booth, Franklin T. Miller and Miss Holden, Richard Miller and Mrs. Franklin T. Miller, William T. Hall and Mrs. Hall, and Captain Charles Morris and Mrs. Morris of the Class of '96. The Park family were well represented. Frank Park came from New York and had as his guests his daughter Marjorie, who is taking the architectural course at the Institute, and Miss Lucile Defren, the daughter of George Defren '95, and his son Franklin A. Park, Jr., who is now at the Fore River Ship Building Company at Quincy, Mass., and who plans to return to the Institute next year to complete his course in Naval Architecture.

Every member of '95 remembers Charles F. Tillinghast as Major of our Cadet Battalion and we have followed closely Tiley's military career during the past 36 years. Every reader will be interested in the following account taken from the Providence Journal of February 25: "Colonel Charles F. Tillinghast of the 364th Regiment, Divisional Artillery, U. S. A., was tendered a farewell party by officers of his command at the Hotel Dreyfus dugout last night. The veteran soldier whose artillery career spans 30 years, has been placed on the unassigned list of the Officers Reserve Corps, U. S. A. He is succeeded in command by Lieutenant Colonel Robert G. Thackeray.

"A silver service, each piece of which bore the arms of his regiment and the platter of which was engraved with the signature of every officer of the 364th, was presented to Colonel Tillinghast by Lieutenant Colonel Thackeray who was toastmaster. Since his first command, Colonel Tillinghast has seen 19 years of service in the Rhode Island National Guard and 11 years in the U. S. A. reserve field artillery. He served during the Spanish-American War and also during the World War. During the World War he commanded the largest completely organized artillery unit in the world — the R. I. National Guard Coast Artillery, which consisted of 2,600 officers and men.

"He started his career as major of the Mowry School Battalion of The English and Classical School (known as Mowry and Goff School). His next command was that of major of the cadet battalion of the Massachusetts Institute of Technology. In 1896 he joined Company B, First Regiment, Brigade Rhode Island Militia. He was elected Captain of A Company of the same outfit in 1897 and in 1898 with the same company, United States Volunteer Infantry, under the command of Colonel Charles W. Abbott, former Adjutant General of Rhode Island, saw service in the Spanish-American War. In 1901 he was elected captain of Company C, in command of Colonel Frank W. Matteson, and in 1908 he was promoted to lieutenant colonel. He was made a colonel in 1909.

"When the First and Second Regiments were combined in the Rhode Island National Guard, Coast Artillery, he continued as colonel in command of the two combined regiments. When he was called into the World War, Colonel Tillinghast was placed on the retired list, R. I. N. G., with the rating of brigadier general and entered the regular service as a colonel. His first assignment was command of the cantonment guard at Camp Devens and later he went to the artillery school at Fort Munroe, Va. After successfully completing the course, he returned to Fort Greble and remained in command until he was mustered out January 20, 1918. He was then appointed colonel of the Reserve Corps in command of the 489th Regiment, Army Artillery, which was changed to the 431st Regiment of Corps Artillery and in 1929 was changed to the 364th divisional artillery."

In a series of articles published by the golf editor of the *Boston Globe* we find our classmate Eugene Clapp receiving honorable distinction for his untiring efforts and efficient services in connection with his greatest hobby — golf, wherein a golf course has been named to his memory. We refer to the article of February 17 from the *Boston Globe* as follows: "Eugene Clapp (Technology '95), quasi-famous in 1928 to the extent that Tedesco named its new nine-hole course after him, may fall a little short in the matter of official entitlements in this series, but in point of executive authority at Tedesco he is the cook and the crew and the captain's mate rolled into one. In deference to the wishes of the club's senior official,

Richard Ward, we take pleasure in making Mr. Clapp the subject of this article.

"Mr. Clapp has been actively in charge of Tedesco's golf from a time that 'memory of man runneth back not the contrary.' To say that he has had a hand in guiding the club through its orderly stages of expansion would fall short of doing him justice, for the fact of it is that he did it all himself. Expansion is his specialty. He was one of the prime movers in bringing about the transition of the club from its old Ocean Point site to its present location in 1902, and as chairman of the greens committee induced his associates to attempt what appeared as a topographical impossibility in advocating the recent extension of facilities from 27 to 36 holes.

"Nobody thought a golf course could be chiseled through the dense woods, ledge and swampland that Mr. Clapp so glibly diagrammed as the prospective site for the new nine holes. 'That region is better suited for bear hunting than golf,' said skeptical members. 'Gene won't get two holes built before he runs the club into insolvency.' They were wrong. Working in collaboration with Wayne Stiles, Mr. Clapp not only carved out a golf course, but he carved out a good one, and without exceeding his original appropriation. It was opened for play last summer and those who criticized in prospect were quick to acknowledge their mistake in retrospect. The new unit is far and away the most spectacular of the lot.

"Mr. Clapp always has made a hobby of golf architecture, and at his home has assembled a library of course patterns that is extremely comprehensive. A subscriber for many years to the product of every golf publisher, he has clippings and photographs in his files of virtually every famous hole and course in this country and Great Britain. So complete are his resources in historical data that his assistance was solicited by the governmental research department a few years ago in its compilation of literature on famous landmarks in New England.

"His golf encyclopedia stood him in good stead in another instance. Informed by his associates that his proposed 444-yard first hole would be too long to conform with accepted drive-and-pitch standards for the getaway, he promptly produced more than 100 score-cards of noted courses, everyone of which showing first-hole yardage figures at or above the 400 mark. Mr. Clapp shuns publicity as he would a pestilence but he isn't falsely modest and never insults the interview's intelligence by unduly depreciating the merit of his own achievement. That's the type that serves golf the best, and that's the type the *Globe* has picked. No praise-shirking hypocrites in this roll of honor."

Ben Donham and family are now sojourning in the West Indies while Johnny Moore and Mrs. Moore have gone to Florida for a rest. — LUTHER K. YODER, *Secretary*, Chandler Machine Company, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N. Y.

1896

The first announcement regarding the Class Reunion at Osterville in June went into the mail a few days ago, and already replies have begun to arrive, with more coming daily. To date the following have said that they plan to be present: Mark Allen, Bakenhus, Beaman, Bragg, Damon, Davis, Myron Fuller, W. E. Haseltine (first appearance), Henry Hedge, Hatch, Hersey, Hewins, Holbrook (first appearance), Hunt, Jackson, Jacobs, Leighton, Locke, Mansfield, Pauly, Pierce, Rockwell, Root, Russell, Henry Sears, Jim Smyser, Stearns, Thompson, Tozier, Tucker, Tyler, Walker, Wise, Young.

Negative replies have come from: Crocker, Faville, Freedman, Hamlet (who is to make a Mediterranean cruise with the Coast Guard in June), Hall, Hawley, Heermann, Hilliard, James, Laws, Leland, McIlvaine, Pennell, Pingree, Mortimer Sears, Tower, Wells, Whitney, and Willis. — Fred Crosby and James Howe say they will make every effort to come, but are unable to make a definite promise at this time. Paul Johnson in California, of the Class of '98, was invited to join us this year, as he is well known to a lot of our fellows. He replied that he was scheduled to make a trip to Alaska on his yacht in June, but that there was a chance that he might sell his yacht, and if he did, there was a good possibility of his coming to our Reunion. Lou Morse is also still undecided whether he can make another trip to New England in the middle of June for the Reunion after attending his son's graduation from Technology the first week of June.

In connection with your Secretary's job as Alumni Secretary he is occasionally able to visit gatherings of Technology men. One happy occasion was on Wednesday, February 25, when he went to New Bedford and was met by the officers of the New Bedford Club, who ordered him to get into the front seat of the automobile with the chauffeur. No introductions were made, and the chauffeur seemed to devote himself entirely to his driving. He finally opened up a little conversation about Technology, and when the car reached Tabitha Inn at Fairhaven, where the dinner was held, the chauffeur finally disclosed that his name was Dave Beaman, and that he had once upon a time attended Technology. It was, of course, a put-up job on the Secretary, and the occupants of the back seat of the automobile listened in to the front seat conversation during the trip with much interest and inward glee.

The Alumni dinner at the Hotel Statler on Saturday, February 28, was a marked departure from previous dinners, in that ladies were present, speaking was brief, and dancing was a feature of the dinner and the hours afterward. Our Class turned out a representative group consisting of Dave Beaman, with Mrs. Beaman and son; Gurney Callan, with Mrs. Callan; Fred Damon; Professor and Mrs. H. W. Hayward; Admiral and Mrs. Morris; and Mr. and Mrs. C. E. Locke. Charlie Gibson was there through most of the dinner,

but was called away by telephone, so he was unable to stay for the dancing. Rockwell was unavoidably absent that night on account of a wrestling match which he was scheduled to attend.

Captain Bakenhus was on the air from Station WNYC at 8:15 p.m., Wednesday, March 11, when he gave an address on the subject, "New York Depends on the Navy and the Merchant Marine," under the auspices of the Federal Business Association of New York. — Billy Anderson with Mrs. Anderson and their son made a trip to Jamaica during the month of March, but no details have been forthcoming as yet. — Joe Driscoll anticipated the golf season by going to Pinehurst in March, in order to get himself in fine shape to take on Damon and Rockwell as soon as the season opens around Boston.

A nice long letter from Con Young, written from Fort Myers, Fla., reported that he and Mrs. Young had been having their ups and downs in Florida this last winter. First of all he and Mrs. Young were *down* under the weather for nearly two months, induced in part perhaps by a strenuous summer on Cape Cod looking after the details of the house which he constructed. They were both in the house in Florida for three weeks with bad colds. Furthermore, the temperature of Florida this past winter has been *down* below the figures which are usually quoted by tourist agencies when they depict the advantages of the Florida climate. Again the clouds hung *down* over Florida this year, so that week after week there were from one to four days of hard rain showers and thick stacks of gray or black clouds. The temperature of the municipal pool at Fort Myers was *down* so that the pool itself was closed down through the greater part of the winter. However, to offset all the foregoing discouraging *downs*, Con had the good fortune to tie up with another winter resident who was an ardent fisherman, and his fishing luck was pretty well *up*. One week they took a houseboat and went well into the Everglades, about 30 miles south of Everglades City, where the only sign of human life was one isolated house. It stormed and blew so hard for four days while they were there that they got only one full day and one afternoon of fishing, but Con landed a 16-pound tarpon, after a glorious fight, which he described in detail. This fellow has now been stuffed to form visual evidence of Con's prowess. He also had good luck in landing a nine-pound red fish and an 11-pound snook. Ten days later he was one of a party of four on a five-day trip, but on this occasion his big fish got away. On their return Con steered the motor boat for 16 miles through the open gulf water in a heavy northwest wind, and consequently landed wet through, in spite of his rubber cape coat. On still another occasion he went with a party on a large cabin cruiser about ten miles up the Caloosa Hatchee and he tried casting in a small tropical creek, which landed him three fish. He and Mrs. Young consider Fort Myers to be an ideal place, as it is a nice, quiet village with little of the sporting spirit, mainly home folks in-

terested in gardens, churches, fishing and touring. The Edisons are there and Mrs. Edison, in her charming way, leads the social and civic thought. Of course, they also see more or less of Henry Ford and Harvey Firestone. On one of their long drives they saw thousands of acres of fine tomato farms all drowned out by the heavy rains and storms of February. The United States is putting a new canal into the Everglades which will mean good drainage and development of valuable land after the canal is completed two years hence. The State will coöperate with a new hard road all the way across the land after it is developed.

Con reports that as a member of the old '96 Glee Club, he has oiled up his voice and has started practicing scales, so as to entertain us at our Reunion. — Paul Litchfield made a hurried trip to Boston on Wednesday, March 25, to speak on the subject of airships before an audience of Technology students which overtaxed the capacity of the lecture hall. The Secretary was fortunately able to see him personally for a few minutes and to receive his assurance that he is planning to be on hand in June. He is kept jumping around more or less, and was leaving in a few days for a trip to the west coast, but he is not planning any European trip this summer.

Myron Fuller has now returned from the trip he and Mrs. Fuller made to South America, and has very kindly supplied the following report, which will be continued in the next issue of *The Review*: During the winter Mr. and Mrs. Fuller visited the comparatively remote sections of French, Dutch and British Guianas and Venezuela, penetrating the jungles of the interior by means of boats. In the three months they were gone they traveled on 21 different steamers, and met many interesting experiences. On one steamer the steward, who was supposed to provide the meals, was without a cent of money and the passengers not only had to advance him funds but loan him their personal servants to purchase and prepare the food. Another steamer, a veteran of 36 years, proved to be an old friend seen in the lower Mississippi many years ago. Still another had been condemned as unsafe and the Fullers were the sole passengers.

From Trinidad Mr. and Mrs. Fuller went on the New York steamer to British Guiana, thence on to Paramaribo, the capital and only city of Surinam, or Dutch Guiana. By that time they were the only remaining regular passengers with the exception of a missionary who moved up from second to first class to "save face" just before arrival. Paramaribo, ten miles up the Surinam river from the sea, although a city of 40,000 people, is without electric lights, has no water system, and there is not a paved street in town. Autos are few, chiefly Fords. The only modern touch is the big Pan-American airplane which stops in connection with the service between America and Brazil and Argentine. The buildings are of wood, painted white, and there is a small park and the usual botanical garden.

1896 Continued

They were fortunate in finding a comfortable hotel with a room facing the river. The other guests, who included Russian and Mexican gold experts and several Americans connected with bauxite or aluminum ore developments, were very friendly. The white people of the town are mainly Dutch, but most of them speak English. The majority, however, are colored, and include negroes and British East Indians; the women in picturesque draperies, silver anklets and bracelets, and gold or silver ornaments on the sides of their noses. In the country districts there are many natives from Java in bright sarongs and turbans.

Near the coast the land lies below high-tide level, being separated from the sea and tidal rivers by dikes. Drainage is by canals, with sluices which are opened at low water. Coffee, sugar and rice are the principal crops, but the plantations do not appear very prosperous. Inland the land is higher but less fertile, and is covered with dense tropical jungle, through which one must cut his path, with some areas of grassy savannas. The forest swarms with wild animals, including the jaguar, and parrots and scarlet flamingoes are abundant. Monkeys are common enough to be a nuisance. An acquaintance of the Fullers, returning from a trip, found his place overrun with them and had to shoot several to drive the rest away. Even then, some 10 "adopted" him and have remained.

It is interesting to note that this whole region, now practically worthless as a possession, was once thought a fair exchange for New York, and was kept by preference by the Dutch when the latter was turned over to the English. — The winter rainy season started only a day or two before the Fullers arrived, but they found the mosquitoes already out in force. They are very small, and said not to be malarial in the city, but they have an exceedingly itchy bite. Their second night was marked by clouds of winged ants, and the third by an invasion of big beetles. What next! Showers come up quickly at all times of day or night. One may start out in the sunshine and yet need an umbrella almost before he gets across the street. Although the distance from the equator is only about that between Brockton and Philadelphia, the temperature at noon is only 85 degrees, and at night sinks to 78 degrees. — They ate Christmas dinner, a good one, in white flannel suits, and were decidedly more comfortable than last year in Jamaica, where in conformity with British custom they sweltered in dress suits. — They made one trip into the interior on a little narrow-gauge railway and another up one of the rivers by steamer. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1897

The belated winter get-together of the Class of '97 was held Monday evening, March 16 at the Engineers Club. The reunions of '97 are usually stag affairs, but

this time the bars were let down and the ladies were out in force. The following people were there: Mr. and Mrs. John T. Alden, Mr. and Mrs. William Binley, Mr. and Mrs. Charles W. Bradlee, Mr. Walter F. Buck, Mr. and Mrs. Louis F. Buff, Mr. John E. Carty, Mr. and Mrs. Charles R. Currier, Mr. Charles H. Eames, Mr. and Mrs. Frederick L. Edmands, Mr. Herbert W. Estabrook, Mr. John Gilman, Mr. and Mrs. George F. Hatch, Mr. and Mrs. Chester D. Hubbard, Mr. John P. Illsley, Mr. Allen W. Jackson, Mr. and Mrs. Ernest F. Learned, Mr. and Mrs. Robert S. Lunt and guest, Mr. and Mrs. Frank E. Mansfield, Dr. and Mrs. Albert P. Norris, Mr. and Mrs. E. C. Sargent, Professor Percy G. Stiles and daughter, Mr. and Mrs. Proctor L. Dougherty, Mr. and Mrs. John Collins, Professor and Mrs. Charles B. Breed, and Mr. Seth K. Humphrey. Harry Worcester was in the wide open spaces and, therefore, unable to be present, but was well represented by Mrs. Worcester, daughter and son-in-law, Mr. and Mrs. Theodore Von Rosenvinge. We also had with us Miss Norma Jane Erbman and Miss Allene Grosart of the Boston Conservatory of Music. Miss Erbman sang some beautiful selections, accompanied by Miss Grosart, which were very much enjoyed by everyone present.

The dinner was very good — at least it was so reported. The "Reporter Extraordinary" also had the dirty work of collecting the money, and as during the dinner seemed to be the appointed time, he would have been better off with a ham sandwich which he could have carried around with him. During the dinner a telegram from Harry Worcester was read regretting his absence. Of course, we missed Harry but we will always forgive him if he will send his family to represent him.

After the dinner Mr. Von Rosenvinge kindly showed us the moving pictures of the '97 outing at Weston last June. Hollywood has certainly missed some very promising material. Last, but not least, Seth Humphrey gave us a very interesting talk, with slides, of his 5,000-mile African trip from Cape Town to the Equator. Our only regret was that he felt that it was necessary to cut it short on account of time.

George Wadleigh writes as follows: "In January the New York Tech Club gave a dinner to which all Tech men, whether club members or not, were asked to come. Walter Spear and the writer constituted themselves a self-appointed committee to get together the '97 crowd. Out of our approximately 40 men in this vicinity, Ben Howes and the writer were the only ones who appeared, and being so few in numbers had to suffer the ignominy (?) of sitting with '98, not much more heavily represented than was '97. Ben was in his usual philosophical mood. There seemed to be many things to discuss. Why Walter didn't appear is not known. Probably Merrick being far in the suburbs of New York, and Walter's commutation ticket having run out, he couldn't find any really good way to get in to the dinner.

"Of the other '97 men, I have encountered Arthur Hopkins once at the Engineers Club, and John Taylor was found eating there on another occasion. John evidently can leave the G. E. in Gerard Swope's hands long enough to come to New York once in a while. As for the writer, his history to date is largely unchanged from last report. While the paper business is fairly active, prices are too poor and productive capacity too great to permit much activity in the lines of new construction. There is, however, ample opportunity for betterment work, sometimes resulting in better products; at other times in reduced cost; the latter not always of benefit to the unemployment situation, as some of the cost-reducing schemes mean equal production with less labor."

The following was received from Tommy Weymouth: "I have my bill for class dues, together with the financial statement; and I am writing not only to say 'hello' but also to tell you that I have moved out of the West and am now located here at 61 Broadway, New York City." — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass. CHARLES W. BRADLEE, *Acting Secretary*, 261 Franklin Street, Boston, Mass.

1899

Clancy Lewis has written me on the letterheads of the Washington State Seniors' Golf Association, Seattle, Wash., of which he is secretary. This is the first strictly state seniors' golf association in the United States, at least that is what the local sporting editors say. Charter membership of this organization closed on December 1 with 72 members, and total membership is limited to 200. Lewis says he began playing golf at 53 and has built up his game to where he had to take a 12 handicap the past season. He is strictly unorthodox in his putting, places his weight on his right leg and keeps his eye on the hole instead of the ball on the principle that when you are throwing something you look at the objective and not the object being thrown. He invites any or all to come out and have a game with him.

William E. Parker, U. S. Coast and Geodetic Survey, Washington, D. C., is going to make a survey of the Grand Banks during the summer of 1931. In the autumn he will continue work in the Gulf of Mexico. Parker's is something of a stiff and steady job as Chief of the division of Hydrography and Topography. — Harold Smithwick of the Cornell Paper Bag Company was in town a few days. We had dinner together and talked over old times. — Norman Seavy who likes to spend his winters in Florida was able to spend only a short time with his family there this year as he was called back to supervise the remodeling and modernizing of their store building at Dover, N. H. From his photographs of the finished job, I should judge that Norman should have been an architect.

Watch The Review for news of '99's forthcoming Reunion in June. Special notices were mailed in April. Ross Has-

1899 Continued

brouck expects to attend with his wife and daughter. He is the first who has definitely stated his intention of attending. — W. MALCOLM CORSE, *Secretary*, 810 18th Street, N. W., Washington, D. C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

1900

A letter from Captain Thurber advises that he has been transferred from Portsmouth Navy Yard to Headquarters of the Third Naval District, New York City. — Chase, not to be outdone by Bowditch and Batchelder, sends in a letter as follows: "The interesting class news in the March Review tempts me to take my pen in hand. We had a splendid time on Cape Cod last summer, didn't we? I've thought many times of the Reunion.

"Bowditch intimates a competition of motor trips, so I enter the following. July first Mrs. Chase, the daughter and I entrained in our chariot — a phaeton — and motored to Los Angeles, via Colorado and Utah, stopping at Bryce, Zion en route after a week in Los Angeles on business (that was my excuse for the trip). Hence to Portland, Ore., via Crater Lake, thence to Salt Lake City, Cedar Brakes, the North Rim of the Grand Canyon across the Colorado River at the New Lees Ferry Bridge and through the wonderful Painted Desert to the South Rim. Then back to Los Angeles via Needles, another week of business and then back to Chicago via Needles, Albuquerque, and Santa Fe — at which place we looked to see that the few acres we own there were still intact as I hope to build and live there some day.

"Total mileage about 10,500 in 55 days. Since then have been sticking around Chicago except for a few trips to New York City and two trips to Mexico City, both, of course, by rail. Am hoping for another call to the West Coast in about three months. That would suit perfectly. You ain't seen no scenery until you have motored through Arizona, New Mexico, and Utah! Last year we saw, by motor and mule, the Great Rainbow Natural Bridge in South Utah. There are many, many interesting places to go to out in the S. W."

This Class was well represented at the Alumni Dinner at the Statler, February 28, as follows: Mr. and Mrs. Bowditch, Mr. and Mrs. Charles E. Smith, Russell, Silverman, Fitch, Graff, Neall, and Ziegler.

The following notice in the daily papers is of interest to us: "West Bridgewater, Mass., March 22 — Frederic E. Foye, 54, a last designer, well known in the shoe trade here and in Brockton, died today at his home, 381 East Street, following an illness of several weeks. Mr. Foye had resided here for many years. He was a veteran of the Spanish-American War; a member of Satucket Lodge, A. F. and A. M.; Harmony Royal Arch Chapter of Bridgewater; Bay State Commandery of Brockton; Damocles Lodge; K. of P., of Brockton; and Shaded Grotto of Brockton. Surviving him are his wife, a son, Allen B. Foye, and a daughter,

Mrs. Ruth Caswell, all of this town." Foye was well remembered as the major of our Freshman Battalion and it is with sincere feeling of sorrow that we record his passing.

Neall writes that he is back now in his Boston Office. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

1901

The trail of the bear is getting fresh. The Reunion is now but a few weeks off — I am guessing about the time of appearance of this letter, actually it is over two months. Replies are coming in slowly but with a reasonable proportion of them recording in the affirmative. I am sending out in the near future another missive to the missing in the pious trust — for which God knows I have no intelligent reason, only an unconquerable optimism that some of you will then overcome the lethargy that business depression, your own urgent private affairs, and other probably less reputable causes seem to have fastened upon you. As a number of the standbys have not yet replied, however, I feel that our tale of attendance will be wholly satisfactory. The Strawberry King is coming up from Virginia, probably one leap ahead of the sheriff, and that in itself is an inducement to that considerable portion of the Class with a settled addiction to small fruits. Al as Ceres, pouring the produce of his own vine and fig tree from a bounteously filled cornucopia, is a suggestion replete with the benefits of that phase of Grecian mythology which centers about Mount Olympus. And Al in an Olympian mood is certainly good company.

It is with mingled emotions that I record the first real record that the Class has made. True, there have been episodes in our somewhat disreputable past to which one might point with some feeling of approbation, at least, but for an outstanding clean-cut demonstration, that which I am about to tell you is unique not only in the annals of the Class but of the entire Alumni Association. Since writing you last we have had the Annual Dinner. This gentle orgy differed in several respects from its predecessors. Tom Desmond as President of the Alumni Association interjected a social note and the ladies, God bless 'em — to repeat the conventional phrase — were with us. Excluded though they were from the towering eminence of the head table — and very properly too — they hovered in beves in immediate contiguity while others of the sisterhood with a courage well founded on traditional Technology chivalry tempted fate — and secured a pleasant evening by sitting with the husband's class. From time to time as the meal progressed the sweet sad strains of the orchestra, proficient in chamber music but finding no opportunity to use it here, lured young and old alike to Terpsichorean exercise on the open floor immediately foreninst the head table. From a cursory inspection, I should say the middle-aged were canny. There were speeches after dinner, a number of them

in fact, and a demonstration of some of the occult mysteries of the Physics Department in the form of strange and beautiful displays of light — but no sweetness. The description of the wonders we beheld also conserved that sound physical principle dealing with angles of incidence and reflection, and it was with fascination that we followed the voice of the speaker caroming from the back drop to approach the far distant microphone with unerring accuracy. Through some inadvertency this latter apparently was not connected with the mechanical loud speaker but the admiration of all was excited by the series of unerring bull's-eyes scored at long range upon the instrument. One of the speakers called the Alumni Association "good looking" thereby scoring a personal triumph which will endure through the ages. As a final touch to the formal exercises led by Stephen Townsend, we sang the Stein Song for the first time in the history of Technology in approximately the tempo that Fred Bullard wrote it. Influenced undoubtedly by former performances, the orchestra, reduced for this occasion to a pianist who could cope with the melody, seemingly only with one finger, and a lugubrious violinist trailed sorrowfully in the rear. We sang two verses and they must have played fully one and a half even though the piano was unhampered by any bass. It was an inspiring occasion.

The rest of the evening was spent in general dancing, an inspection of the extremely interesting exhibit which Horace Ford had prepared, and probably a little serious gustatory exercise. But this tale of Sardanapalian splendor was but the setting; the real event was the record of the Class of '01. For the Class with a unanimity of action worthy of a better and more important cause, allowed the full duty of representation to be invested solely in the modest and slightly obese person of your Secretary. Casabianca was a shine compared to it. True the deck did not burn but his cheeks, ears, and back of his neck maintained a steady and uniform glow as he gazed at the cohorts from every other class in the Institute disporting themselves on the dancing floor, coping with the food, applauding the speeches, and otherwise behaving in an elegant and housebroken manner. Conscious of his own limitations, mindful of the responsibilities thus involuntarily placed upon his shoulders, bereft of the support of Charlie Bittinger far distant in Washington, he struggled alone through the evening. But, frankly, as a performance it was not so hot. Mere flesh and blood has its limitations and even though the dire experiences of years foregone have steeled his panoply and hardened the cardiac and other viscera which lie beneath its shelter, it was too much. And so at the close of the formal exercises he fled unable to bear longer the onus of a task to which he was but ill-fitted and which God knows he did not seek.

All of which — with a change of tempo and the lilting of lutes, dulcimers, and psalteries in the gay notes of the springtime — is intended to bring to

1901 Continued

your attention that the glorious Class of '01 is to hold a reunion, of which those members, at least those who are literate, have had the opportunity to be informed, and that it is to be hoped when the time of foregathering arrives the Class will make a second record — this time with reverse English — and swell the attendance to heights never before scaled. The priceless items of news which are so grudgingly and infrequently laid in my avid palm I hold against that evil day — for me, dear brother, as well as for you — when in the normal course of time I face my editor, if not my God, once more. There is a tag of Latin that applies to this situation. I offer a prize to him who will send it to me in its native garb. — ALLAN W. ROWE, *Secretary*, 4 Newbury Street, Boston, Mass.

1902

Thayer Gates has moved his office from Providence to 66 Leonard Street, New York, where he is carrying on as a specialist in textile manufacture. — Elmer Hervey's address is 3264 Blaine Avenue, Detroit. — Professor Philip R. Whitney is on a year's leave of absence from the Department of Architecture at the University of Pennsylvania on account of a nervous breakdown. He has spent the winter in Florida receiving some benefit which we trust will be continued. — Lou Cates, who is President of the Phelps-Dodge Corporation with offices in New York and extensive mining operations in the west, has been elected President of the Mining and Metallurgical Society of America. It is interesting to note that he succeeds another Tech man, G. Temple Bridgman '08. — The leading article in the March issue of *Architecture* is by our literary member, Rayne Adams. It is a study of the architectural work of Ray Hood of the Class of '03, and is written in Adams' usual cogent style.

The Class Outing will be held June 12-14, at our usual stamping ground, the Riversea Inn, Fenwick Point, Saybrook, Conn. While officially the program is to arrive Friday afternoon and stay through till Sunday afternoon, landlord Hoag will be quite willing to accommodate anyone who wishes to come earlier or stay later. As for several years past, this is a family affair. The presence of the members' wives and sons and daughters (some of whom are quite as big as their fathers and mothers) has been a pleasant feature of our outings, especially last year's.

We have had word recently from Miami, Fla., about Arthur Smith More. The following account gives us an idea what he has been doing since graduation. More was for several years in railroad work in the Central States having served as division engineer of the Cairo division of "The Big Four." Subsequently he went into executive work, being Vice-President of the Union Fibre Company of Winona, Minn., and then into truck manufacturing having been located with the Selden Truck Company of Rochester, going from there to the Indiana Truck Company, Marion, Ind., and more recently was located in Detroit. More was mar-

ried in 1907 to Miss Louise Laidley. Their only child, Frederick L. More, born the following year, died in 1916. — FREDERICK H. HUNTER, *Secretary*, Box 11, West Roxbury, Mass. BURTON G. PHILBRICK, *Assistant Secretary*, 246 Stuart Street, Boston, Mass.

1903

Our Class held an informal luncheon March 9, at which it was decided to hold the Annual Dinner on June 18 at the University Club. It was decided to invite the ladies to this dinner.

Tolman has been the recipient of considerable publicity in connection with his studies in relativity and bids fair to rival Einstein. He is said to have a blackboard on the upper half of his office door and in the words of the associated press reports "he sells ideas to his callers — mathematical ideas about relativity, ionization, colloids, conductors, principles of similitude and statistical mechanics, the subjects for which he is internationally famous in the scientific world." He is described as we all recognize him — tall, dark, and with a pipe almost invariably in one hand, chalk in the other and he faces his caller with a smile, speaking rapidly in his soft voice. Since graduating from Tech, Tolman has been at the Universities of Cincinnati, California, and Illinois, and is now professor of physical chemistry and mathematics at California Institute of Technology.

The secretaries had a short call from H. S. Morse who is still with the Indianapolis Water Works. These calls are altogether too few and we would appreciate it if other members of the Class looked up either or both of us whenever they are in Boston. Howard asked to be relieved as the Class representative on the Alumni Council at the annual meeting of the Class in June, and James A. Cushman was elected in his place. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 89 Broad Street, Boston, Mass.

1905

Roy Allen writes that on November 6, at Columbia University, Doc Lewis presented the Graselli medal of the Society of Chemical Industry to Dr. Frolich '23, for his work on catalysis under heat and pressure. Our Doc gave an interesting review of Frolich's work and its importance. It has made it possible for the Standard Oil Company of New Jersey to produce 100 gallons of gasoline from 100 gallons of crude oil. How Doc could have missed this when he was giving so much time to the S. O. Company is a mystery.

Roy goes on: "At the annual meeting of the American Institute of Mining and Metallurgical Engineers last month I saw a few of our classmates: Billy Keen, who is now consulting engineer to the company for whom he has been metallurgist; Bill Motter, whose daughter is now five months old, and is quite a girl; Hallet R. Robbins, who had just returned after three years in Chosen (Korea); and Ben Lindsly who was on from Bartlesville, Okla., and whom I had not seen since

1905. He is the same Ben, in spite of daughters in college. He was to present a paper before the Petroleum Division of the Institute, but I did not have opportunity to hear it, and I have not a copy to send you."

According to the *Simplex Spirit*, house organ of the Simplex Wire and Cable Company, Vice-President Charles R. Boggs was in Florida in February to witness the laying of some of their submarine cable. The first week was spent going down the entire east coast and getting acclimated. Stops were made at Jacksonville, Daytona Beach, Palm Beach, and Miami. Charlie seems to have spent most of the second week on the Coast Guard cable ship *Pequot* though he had some experience on a "Six Bitter" or 75-footer, and the motor sailers. The last week was spent on Miami Beach vacationing and with the beach and the horse races, dog races and Jai-Alai games, he was able to occupy his time very enjoyably. The weather was not perfect and the pictures cannot be reproduced.

Listeners in on the New England trials of the Intercollegiate Glee Club Contest, held in Hartford, Conn., in March, heard an M. I. T. Alma Mater song written by Russell '00. Who of '05 ever heard it before and when was it adopted? It was a new one to us. — John Glidden's latest address is Cerrode Pasco Copper Corporation, Mahi Tunnel, Peru, S. A. — Hub Kenway's legal outfit is now Kenway and Witter, still at 68 Devonshire Street, Boston. — The receipt from Grove Marcy of a box of cuts used in early issues of the '05 *Flivver* indicated a house cleaning by the Sampson and Murdock Company. Sure enough, an announcement soon arrived of its move to 179 Lincoln Street, to quarters vacated not so long ago by George Thomas and the United Shoe Machinery Corporation — 337 Broadway always seemed a long way out of town. Once your Secretary took a nap in a car in the subway headed for North Station and woke up as he passed 377, headed for City Point. This event has never before been reported.

In reply to a demand for an accounting, Ernest Harrah wrote: "For the last several years I have retired from active business and attended to merely personal affairs, spending the winters here and being away a good deal of the rest of the time. Strange as it may seem, or believe it or not, which you prefer, it has kept me pretty busy. In fact I several times wished that I had the leisure to loaf that a good many chaps I know seem to have, and who still find opportunity to spend a good deal of their time in their offices. Still, I was relieved to find out that you knew where the rest of the Class were. I was beginning to believe that you had spring fever, as in these days when district attorneys are active and grand juries not sympathetic, it should not be too hard a job to keep track of most of the tax payers. I'm glad that all the rest are accounted for."

Albert Gilbert had an unpleasant time last fall with arthritis but is now quite recovered. He writes: "Mr. and Mrs.

1905 Continued

Charlie Mayer and the oldest daughter Helen (the one that went to Boston) were here one Sunday about six weeks ago, and I have heard since that Charlie has been sick a lot since. I hope that some day we can stop a minute in Middletown as we go through — it is always fairly late when we get there, and we have an hour's drive beyond to get to mother's, so we feel we must skip on." He is the most consistent through-driver we know of. We hope he will sometime arrange to stop. It is surprising that so few classmates find Middletown right here on the best road between New Haven and Hartford. And a best road in Connecticut is worth taking.

A visitor from Kentucky reports that Jim Barnes did a wonderful piece of work with the Louisville Railway and that the real folks down there are mighty sorry to see him go. — Chester Shaw has been in the auditing department of the United Shoe Machinery Corporation, Boston, for two years. He was, he says, in public accounting and got his C.P.A. in Massachusetts a few years ago.

Your Secretary will report a trip to the Middle West. Late in February I left with the head of our department of Physical Education to inspect the athletic facilities of a few institutions. The first stop was at Rochester where they have built an entirely new men's college, thanks largely to Mr. Eastman. Then overnight to Ann Arbor and ditto to Bloomington, Ind. Thence to Chicago and Madison, Wis. We were interested in the removable, sectional basketball floors used during the basketball season in their dirt floor field houses. A gallery of 10 to 15,000 spectators at a basketball game is not unusual.

I had expected to telephone Dan Adams in Ann Arbor but his name was not in the book and he has doubtless moved. [Just as this was written, the following letter was received from Mrs. Dan Adams, 402 Lee Street, Evanston, Ill.: "As Dan noticed that you tried to call in Ann Arbor 'even though you were sure he would be out of town,' he suggested that I answer your letter. Sorry I am that we (editorial) were not there to greet you. We sold our house last summer — that is we sold part of it and threw in the rest — and we are now filed away in the catacombs of Evanston. Dan's office is still in the Wrigley building and his business (if any) is the same. He is keeping up his courage during this chapter of our wanderings by dreaming about a small farm in Connecticut, near the salt water — not meaning to add to the farm surplus, but just wishing for a place to unlace. My part in the scheme is to find the farm! If you know where it is, please telegraph collect."]

In Detroit I got E. C. (Chug) Grant and was much pleased for it was the first time I had had a word from him, spoken or written, since 1905. And that in spite of the fact that he and I once designed a remarkable steamboat of which, however, he may have been ashamed. Grant says he is a manufacturer's agent selling doo-dabs to automobile manufacturers.

I tried Waldso Turner at his city apartment, suburban home and country estate (in Pontiac) but no one answered and he was probably on a southern cruise.

In Chicago I had a nice talk with Adolph Ortseifern who, upon learning that I was going to Madison, Wis., cordially invited me to drive with him to Oconomowoc (accent on the second syllable, please), where he was going on business. As he could not guarantee my delivery to Madison, I was forced to decline with thanks. Later I remembered that Wallace MacBriar was in Oconomowoc and when I telephoned him, he said he would gladly have driven me to Madison. But it was a pleasure to have talked with them as well as with Frank Payne in Glencoe and Le-Baron Turner in Geneva, Ill. I hadn't seen Duke for 25 years either. He is with the U. S. Wind Engine and Pump Company, Batavia. He says that for some years he was in sanitary engineering in Chicago, associated with Sam Greeley '06. MacBriar is still with Carnation Milk. I failed to identify any of his contented cows near the C. & N. W.

A lay-over in Buffalo on the way back, provided a chance to telephone T. Green and Alden Merrill, but Carl Houck could not be found. It seemed a shame that only a few miles separated me from all these good fellows and yet I could not get to one of them. The telephone conversations, however, were a very real pleasure. — ROSWELL DAVIS, *Secretary*, Wesleyan Station, Middletown, Conn. SIDNEY T. STRICKLAND, *Assistant Secretary*, 20 Newbury Street, Boston, Mass.

1907

We have examined our files, looked over the class list, and even tried to use our imagination, but not an item of class news has filtered through since last month. We are not very often caught entirely without ammunition but this time we haven't a shot to fire. We shall hope for better luck next month, and you who read this can help if you will send in any news about yourself or any classmate. — BRYANT NICHOLS, *Secretary*, 2 Rowe Street, Auburndale, Mass. HAROLD S. WILSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1909

On March 14, the New York members of the Class held an informal luncheon, at which 17 were present — but let Paul Wiswall tell it to you as he did to me: "This time we had several new faces; several of whom I cannot recall seeing since we graduated. There was Ridsdale Ellis, whom I remembered best, because he took Course VIII, Option 3, a course I think I should have taken if I had had a little more courage. He is a patent attorney at 225 Broadway. I asked him what patent attorneys wanted to know about electro-chemistry and why he took such a course at Tech. His reply was that he felt he would get a good technical groundwork in that course. He did!

"Hardy Cook, one of the old standbys, brought along Ed Howe, who is listed as a '10 man, but whom you'll remember at Osterville two years ago. Ed is now with the Brooklyn Edison along with Hardy. — Bernard Fuller is with the Trojan Engineering Corporation, 40 Exchange Place, New York. — John Hatton came for the first time I can remember. I was much embarrassed that I did not know him as he came into the Club. I try to get a line on any newcomers by looking them up in the Portfolio and seeing how they looked at graduation; but for some reason Hatton was not in the Portfolio. He is an architect at 665 Fifth Avenue.

"Many of the men look just about as they did in 1909. I do not believe that Chet Pope or Ellis or Reg Jones look a day older. Some contours have been amplified in 20 odd years — that is the most noticeable change. Yours truly takes the palm on the loss of thatch, though foreheads are getting higher in many a man. — Francis Loud, who is with Jackson and Moreland, and has been working on the Lackawanna electrification for the past two years, has almost finished his work with the Lackawanna and expects to move to the firm's New York office soon. George Gray is still with the International Tel and Tel, but his address is 67 Broad Street, New York. — Dunc Green, between numbers in an informal piano recital after lunch, told us that his firm had been absorbed by the publishing house of Putnam. — Tom Desmond sent regrets that his duties in the New York State Senate were keeping him in Albany."

Allen Jones writes the following from Asheville, N. C., now being superintendent of the Clyde Mills, Inc.: "About a year ago I left New York and moved back down home and accepted the position as superintendent of two of our affiliated mills. Since that time, we have started up one of the mills formerly operated in the Martel group at Asheville, N. C., and I am looking after this one, also. My work in New York as assistant manager, purchasing agent, engineer, and so on, was very interesting, but it only concerned figures. Down here I deal with real live people, and I have gotten a great deal more pleasure out of it. I have always enjoyed lending a helping hand to fellows working for me, and I have plenty of opportunities to teach real deserving men to make more for the Company as well as for themselves. I have developed a very fine morale among our people at the two mills in Newton, and the spirit which they have shown has enabled us to keep the mills in operation full time during 1930. Working the big town suits some of you high brows, but my mission is down here where folks really do things."

Only six '09 men attended the Alumni Dinner in Boston on February 28. Tom and Mrs. Desmond, Carl and Mrs. Gram, Brad Dewey, and Delos Haynes. Haynes is a patent lawyer in St. Louis, but happened to be in Boston on business at the time of the meeting. — John Willard's oldest daughter, Virginia, is in

1909 Continued

her junior year at Vassar, and has the honor of being on the Dean's list of high-ranking scholars. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. PAUL M. WISWALL, *Assistant Secretary*, General Foods Corporation, 250 Park Avenue, New York, N. Y. MAURICE R. SCHARFF, *Assistant Secretary*, First National Bank Building, Pittsburgh, Pa.

1910

The busy B's are still buzzing in. Bob Breyer's secretary writes that he is on a world tour, and Professor Locke had a letter from a Japanese student who had met Breyer in Tokyo. We'll hope to have a good letter from Bob when he returns. — I didn't get to the Alumni Dinner last month but understand it was a great success. Herb Cleverdon was there and says that the class was represented by Gorton James, Leroy Briggs, and Jack Babcock.

Benton writes: "Nothing special of note to report. Am still with the Bell Telephone System. Started to dictate a real letter to you a month ago when I received this S. O. S. but it was interrupted and never finished, so will just jot down these few lines for the present. Haven't run into any 1910 men of late. G. W. McRae, who is Vice-President and General Manager of our New Jersey company gave some of us who are engaged in telephone accounting and statistical work an interesting talk at our regular monthly luncheon the other day. Would certainly like to have you or any of the other 1910 men drop in to see me at 195 Broadway whenever you get down this way or if that isn't possible call me up and we'll arrange to have lunch together. Haven't stopped off in Boston for a long time. I generally get up to Lake Winnepesaukee each summer but usually avoid driving through Boston. The old town doesn't look or seem the same to me any more. Time effects many changes in 20 years."

Cecil Blanchard sends in this: "A letter like yours of yesterday which shows interest in me rather than a famished bank account deserves immediate reply. Here it is. Viewing the tactics of germs on human battlefields and laboratory testing grounds during the 20 years since Professor Sedgwick sent us out among the 'Docs,' led me to compare the ways of microbes with those of men. The idea is not new but it's helpful to an epidemiologist. The result has been an attempt to set the red light against some common, household ways of passing diseases around; for example, to banish from bathroom and sink the still too common drinking glass."

"I find chances to season orthodox public health work with popular talks, articles and even playlets which give me a kick in the right place and I hope do the same to communicable diseases. Being editor of *Public Health News*, I have at least one editor who accepts the products of my imagination and type-writer. For recreation, I have been repairing, remodeling, and adding comforts to one of the few old houses in this section in

which Washington is not supposed to have slept. I recommend the idea to architects and engineers and to any who want to learn all the building trades. Truly, though, the credit should be given to a patient wife and to four children who thrive on confusion. Notify me when my turn to write comes again in 1941. Best wishes to you and the class."

Brownell seems to appreciate The Review notes this year and does his bit. "Glad to see the class notes increasing in The Review and will add my two cents' worth. Came over here to Philadelphia in 1928 as head of the Structural Engineering Department of the United Engineers and Constructors, Inc., after having held a similar position with Dwight P. Robinson and Company, Inc., in New York for several years. The company here handles design and construction work on power houses, industrial plants, railroad terminals and shops, and so on. During 1929 and 1930 was with the Pennsylvania Railroad in charge of the structural design work for their Philadelphia improvements. This work consists of a complete new passenger terminal in West Philadelphia with a new underground suburban station just north of the old Broad Street Station, and involves numerous bridges and viaducts, a section of subway and a two-span, six-track, concrete arch bridge over the Schuylkill River, and, of course, presented many interesting engineering problems."

"I have not come in contact with many Tech men in recent years except A. B. Merry who is with Dwight P. Robinson and Company, Inc., in New York. Your idea of sending out that letter is a good one. Trust that the results continue." — DUDLEY CLAPP, *Secretary*, 40 Water Street, East Cambridge, Mass.

1911

Announcement that Dean Alfred E. Burton, whom we all remember so happily, is to be the guest of the class at our Twenty-Year Reunion was most enthusiastically received by classmates and at once stimulated favorable replies. Dean Burton says he is looking forward to meeting his old friends with great enthusiasm.

In addition to being general superintendent of one of the largest corporations in the world, Bunny Wilson, XIV, of Pittsburgh, is now one of the vice-presidents of the Aluminum Company of America, we are informed by Heinie Zimmerman, IX, who is assistant to the Vice-President of the American Sheet and Tin Plate Company, also in Pittsburgh. Wilson has made a great mark for himself with his background of electro-chemistry and his success is certainly a great credit to himself and the Class of 1911.

Zimmerman also advised that Ernest Symmes, V, has recently been elected chairman of the Delaware Section of the American Chemical Society for 1931. *Industrial and Engineering Chemistry* in its issue of February 10, cites Symmes as a graduate of Winchester (Mass.) High School and M. I. T. and adds: "After

a few months at the Bureau of Standards, he went with E. I. du Pont de Nemours and Company, first at Gibbstown, then at Kenvil, N. J., until the reorganization in 1913. He then remained with the newly formed Hercules Powder Company at Kenvil, and from 1915 to 1917 was assistant superintendent of the Bacchus, Utah, plant, and from 1917 to date has been employed in the Chemical Department at the Wilmington office." Best wishes for a fine year, Ernest.

Dippy Allen, II, so Obie Clark, I, of the Reunion Committee says, is particularly happy in his new work in Washington, D. C., where he is engineer of gas distribution. Dave says everything is modern and up-to-date there and "it's an honest-to-God gas company, not a combination gas and electric — one must work in a 'combination' company to fully appreciate what that means from a gas man's point of view." — We are all proud to see two '11 names on the Alumni Association ballots this year — Emmons Whitcomb, X, for Corporation term membership and Bill Coburn, I, for A. A. Executive Committee. Both boys are hustlers and plan to be at the Reunion.

Under Boston Personalities in a recent issue of the *Boston Herald*, Mason Ham commented thus: "We forgot to tell how Munroe Pevear, IV, a year ago rearranged the lighting in Carnegie Hall (New York). The old system suited the musicians but the audience for some 14 rows suffered badly from the glare. The problem was to leave the players undisturbed and spare the auditors."

"Utilizing false beams, installing mirrors, carefully placed, Mr. Pevear changed the whole system. It suited him and it pleased the managers and trustees, but he was a little worried about the musicians. You know these artists. It was decided finally not to tell them anything about it. Toscanini was conducting and the job was finished just two days before his first rehearsal of the season. Now Toscanini allows no one — absolutely no one — at rehearsals. Mr. Pevear, therefore, concealed himself in Carnegie Hall before the rehearsal started. Nobody noticed him and, for an hour and three quarters, nobody noticed that the lights had been changed. A player at length began to look around suspiciously and then another and another. The whole orchestra was soon looking around but they couldn't seem to find what was wrong. They went on peacefully, finished the rehearsal, and went through another one the next day. Not until then were they informed of what had been done, and it was too late then to fuss much after their two days of ignorant bliss."

It sure was great to get a letter from good old Bill Salisbury, II, the other day. Bill is out in Detroit now and says he is hoping and praying that he'll get a break and be able to make the reunion. Bill is now with the American Radiator Company there in Detroit and he says that having "fooled the manager into giving me a chance, I will now have to try to convince him that I am entitled to a vacation at just the right time to con-

1911 Continued

nect with the reunion." With his letter Bill enclosed an interesting plot sheet on transparent celluloid, known as "aerograph" — something Bill says he designed in connection with estimating heat loss from areas on architects' plans. Bill says: "So far I have not tried to put it on the market on account of the economic conditions, but I have hopes that the return of business activity will cause a call for it in years to come." If you are interested in one, address Bill at P. O. Box 1414, Detroit, Mich.

Our party at the Annual Alumni Banquet at the Statler in Boston on February 28, was one more than our usual eleven. We had in addition to your scribe and his wife, Cal Eldred, VI, Morell Mackenzie, II, Roy MacPherson, II, Emmons Whitcomb, X, and their respective wives; and O. W. Stewart, VIII, and Charlie McManus, I, stag.

Reservations for our reunion have come in nicely and Chairman Stewart and his committee mates are all set for the best ever. — ORVILLE B. DENISON, *Secretary*, Douglas Inn, Douglas Hill, Maine. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

Your Reunion Committee is open to any and all suggestions as to location and other details for our Reunion, now scarcely more than a year in the future. A little later on we're going to take a census of the members of our Class, as to their preference for the site of our Reunion. Meanwhile, any suggestion will be welcome. Your Assistant Secretary (address below) has been officially sentenced to the job of Chairman of the 1932 Reunion Committee. He needs your co-operation and sympathy.

A series of Faculty-Alumni Seminars is being conducted at the Technology Club of New York. We note on the program for the spring of 1931 that Professor Erwin H. Schell, acting head of the Department of Business and Engineering Administration will represent that department at the seminar of May 11.

Vincent W. Allen, II, has come through with a few notes for this issue. What he says in the first paragraph of his letter might well serve to stimulate similar action by some of our other classmates. "I thoroughly enjoy the Class Notes in the Technology Review," he writes. "In fact, I turn to them before I look at anything else in the magazine. I don't believe that I have ever contributed to these notes but I will outline to you briefly what I have done since graduation. First, the principal step, of course, was to select the right helpmate and in 1913 I married Miss Brackett of Boston who graduated at Emerson. After a few preliminary jobs I became connected with the American Brass Company and started in at Torrington, Conn., where I worked until 1922, when I was transferred to Toronto, Ontario. In 1927 I came to Detroit and became connected with the Michigan Copper and Brass Company, which since has become the Michigan division of the

Revere Copper and Brass Incorporated. We have had four children, but unfortunately lost the two oldest who were boys. We have two of the finest little girls, Joy, aged six and Ann Joan, aged four. We will be happy to see you or any of our old friends whenever you or they are in Detroit." Allen may be addressed care of Revere Copper and Brass, Inc., 5851 West Jefferson Avenue, Detroit, Mich. He neglected to mention it, but the records give him the title of Vice-President.

We are glad to report hearing from Rowley, II. On a letterhead reading "from the Architectural and Engineering Office of Charles Bacon Rowley and Associates, Inc.," we received the following bit of news: "Business in this section is extremely quiet but we are fortunate enough in having three nice residences in the process of building, and a few others in sketch stage, which we hope will go ahead this spring. We have finished some factory work for the American Fork and Hoe Company, and I must say that my degree in Course II is not exactly apropos of architecture, however, the engineering training is extremely valuable. I like architecture much better and all of us enjoy the residence work even though it is less profitable than an engineering commission." Rowley has very kindly sent us a copy of an interesting little booklet entitled "My Future Home and the Architect," a product of his own pen, published and sold locally in Cleveland. He is now considering the possibility of securing wider distribution for it.

From the Alumni office we have received several newspaper clippings of United Press reports from Paris referring to the late Kenneth Weeks, IV, the first American volunteer in the French Army during the World War. Weeks, a Boston boy, was born at Chestnut Hill, and attended the Institute as a member of the Class of 1912. He joined the French Army on August 21, 1914, and was killed in action June 16, 1915. So much is history. Now a storm has arisen in Paris. It seems that the owners of the apartment house which was Weeks' home before the War have refused to permit the local veteran's organization to place a plaque there in memory of our classmate. Just how it will work out we have yet to learn, but the United Press dispatch reports that the French veterans have joined the Americans in demanding permission to place the plaque.

The letters received this month indicate that at least a fairly good number of men have gone into business for themselves. Richardson Ayres, I, tells of his experience since graduation in the following interesting letter: "After leaving the Institute, some 19 years ago, I worked at various engineering jobs until 1915, when I went into the private practice of engineering at Texarkana, Ark., doing general engineering work. Most of the work we did was drainage, highway and levy construction. Taking out the intermission, caused by the World War I continued in this line of work until 1922; at that time I went to work for the Arkansas State

Highway Department, as district engineer, which job I held for five years. Because of a change in the administration in 1927, we all got the air, and due to the fact there was very little engineering going on, and the further fact that I had a large and growing family to support, I went into the contracting business, under the firm name of Ayres and Graves, of Hope, Ark. This firm is still doing business in spite of the recent depression and many bank failures in our section. We do a general construction business in every line, except building construction, and have been fairly successful in a small way. At present most of our work is in Arkansas and Louisiana. I have not seen any of the boys in our Class for some time, though there are a few of them scattered around in this section. The last classmate I saw was Welch, who is the chief instigator of the Welch Dry Kiln Company with headquarters in New Orleans. I was in New York for a few days last year; I am sorry I did not know where you lived, or I would have come around. Perhaps I will be up there again before long. If I do, I will certainly look you up."

Charles H. Carpenter, II, dropped in to see us recently. He is associated with Charles E. Fox '14 in the Belgrave Press, Inc., 230 West 17th Street, New York City. Charlie has promised us some history for a future issue of The Review. — A brief note from Bill Bird, I, advised us that he was planning to sail March 28 on the S. S. *Leviathan* for a trip to England and other parts of Europe in the interests of the Prophylactic Brush Company of which he is Vice-President and General Manager. And at the time of writing these notes, your Assistant Secretary and Mrs. McGrath are planning to sail March 20, on the S. S. *Evangeline* for a two weeks' cruise to the West Indies, visiting Nassau, Jamaica, and Havana, Cuba.

At the Annual Boston Alumni Banquet, our Class made the best showing for some years as we were represented as follows: Professor and Mrs. Schell, Bill Bird, Ralph Doane, Clarence Reiman, John Lenearts, and your Secretary. We will hope that next year more ladies will venture out, as apparently they were a bit backward in taking advantage of the invitation which was given them this year for the first time. Let's all give Dave a hand in helping him make next year's reunion the best ever. Suggestions will certainly be appreciated. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 10th Avenue and 36th Street, New York, N. Y.

1913

By a belated and round-about way we learn of the death of Elliot H. Gage in Chicago last July. Heart failure following influenza was the cause. Our deepest sympathy goes out to his widow and the two children. This item was sent to your Secretary by George Bakeman who resides in Paris. Rather a curious way to receive news about things in your coun-

1913 Continued

try. Bakeman has lived in Paris for several years, working for the Rockefeller Foundation. We hope his next letter will tell something about himself and his work.

Henry W. Dew, who is with the Al-mours Securities, Inc., in the Barnett National Bank Building, Jacksonville, Fla., writes that in that part of the country he has very little contact with his classmates, and with the exception of seeing Al Gibson in New York during the summer of 1929, he had seen no classmates for three or four years. He fears that down in Florida he will be rapidly growing out of touch with the old order of things. He occasionally has a longing to get back to his old line of technical work, and hear the gears turn and smell the foundry smoke, and see some of his old metallurgical friends. However, he likes his work in Florida very much, and has never regretted the change that he made from technical work with the Union Carbide and Carbon Company. His present work is of an entirely different nature, but is extremely interesting. His parent company deals mainly in securities, investment banking and banking, but there are several subsidiaries in other lines and considerable real estate to be looked after. Their main expansion during the last year has been almost entirely along banking lines, so that they now have six affiliated banks in Florida, all of which have made splendid progress and are in a very liquid condition.

His little girl is now almost three years old, and his family was enlarged eight months ago by the arrival of Henry W. Dew, Jr., who is expected to become a freshman at Tech about 18 years hence. He expresses sympathy for the poor fellows who are located in New England, and says that Florida golfing season is in full swing and he has a chance to get out quite frequently. Since Jacksonville is more or less of a gateway to southern Florida, he hopes that classmates who may be traveling south will not fail to stop off and see him.

Bill Brewster, our genial class President, comes to bat with a short but interesting note. Just how many of the class recall the class baby, née Ready? Well, she is married! Tempus surely does fugit. Bill, through the coöperation of those who showed up at our last class dinner, has forwarded to Mrs. John Read Bain (that's her name) a piece of silver tableware as a wedding present from the class. Some day Pa Ready will be dropping into the office and announcing himself grandfather.

Charlie Thompson is, as many know, Assistant Treasurer of the Thompson-Durkee Company in Boston. Beside the usual business and social activities, Charlie is President of the M. I. T. Varsity Club following a long period on the Advisory Athletic Council of the Alumni Association. — Railroadroading has claimed Joseph A. Tennant. He is Vice-President of the Rio Grande Eastern Railroad. He is also President of the Tennant Company in Houston, Texas. Mrs. Tennant and four children complete

the family. From his remarks membership in three large Houston clubs makes up a large portion of his social life.

Albion Davis is chief engineer of the Mississippi River Power Company with headquarters at Keokuk, Iowa. Perhaps he will write us about his work and the problems of the large and well-known power station on the river at that point. He tells little about his personal affairs. — Alexander Pastene is a chemist with the Monsanto Chemical Works at St. Louis. He makes his home with Mrs. Pastene and two children at Webster Groves, Mo. — The North Adams (Mass.) *Transcript* last month ran a short notice about Arthur K. Adams. It stated that he was in the contracting business in Atlanta, Ga., and had just received a \$2,000,000 contract for a new thread mill in Austell, Ga. The mill was to be built for the Clark Thread Company of Newark, N. J.

Arthur H. Clark is employed by the U. S. Rubber Company in Naugatuck, Conn. He lives with Mrs. Clark and three husky boys in Whitneyville, a suburb of New Haven. No further details were listed. — Tom Collins spends all of his spare time in golf and gardening, living at East Orange, N. J. As a side line he is superintendent of the Pittsburgh Plate Glass Company at their Newark plant. Two daughters and Mrs. Collins make up the family.

Municipal work has claimed Harold Crocker. He is city engineer for the City of Brockton, Mass. No doubt he bumps into Ken Hamilton once in a while for Ken is with the George E. Keith Company in the same town. Crocker belongs to more extra-curricula activities than space will permit mentioning.

Joe Summerville is with the Electric Bond and Share Company as assistant engineer in the foreign department. His home address has a rather horticultural aspect, namely Carnation Avenue, Floral Park, Long Island. He still sticks to his old hobby of radio. — Arthur Kenney whom we used to know in high school as well as at the Institute, is a research chemist for du Pont. He is at the experimental station at Wilmington, Del., and lives in Marshallton. In his remarks under hobbies is the following line: "Music, especially home-made." We just can't fathom that one.

Among our executives is Adolphe Cardinal. He is President of the Cardinal and Wiseman Company of Paterson, N. J., and lives in Upper Montclair. Golf and bridge occupy his spare time. — The last we heard, Ed Cameron was an engineer with Jackson and Moreland in Boston. He lives in West Newton.

A very pleasing letter comes to hand from Arthur Hirst who is superintendent of the American Print Works in Fall River. We are quoting portions of his very newsy letter which speaks for itself. "Last summer I was driving through New Haven on the way home from a vacation and was in luck in locating my old '13 buddy, Art Bellis. We both agreed to write for the class notes and my only excuse for not being stricken with re-

morse for the delay is that I've got ahead of him.

"Besides favoring you with a line, our intention is to try to arouse some life in the Course V bunch. If they haven't all blown themselves up in research work, or retired on their fortunes with the gout, let's hear from them. Art Bellis took me around his heat testing plant, which was very interesting and a fine layout, although all I know about steel is that it has something to do with iron. He took my party out to his home in Branford, and we spent a pleasant hour or two with him and Mrs. Bellis. They have the same large family as the Hirsts — one cat and one La Salle car.

"I seldom see any '13 men in this part of the country. George Darling, Fall River's leading architect who was with me at the Swampscott outing last summer, designed a house for me last year, and, with his usual efficiency, did a good job on it. A caller at the plant recently recalled to me Guy Buchanan. I've forgotten where he is located, and should like to hear from him. As for yours truly, I'm still at the same old stand, printing Borden Fabrics at the American Printing Company, the largest manufacturers of printed fabrics in the world, and, of course, being Borden Fabrics, they are the best. The cotton business has suffered a severe depression, but we have managed to keep going at our usual pace of about four million yards a week. Try Borden Fabrics on your wife — they'll never fade.

"Well, Art, I'm hoping you can stir up some life in the Course V crowd, and if any of them happen to be in Bermuda during the next few weeks, tell them to look me up. I am going down for a so-called 'much needed rest.'" — GEORGE P. CAPEN, *Secretary*, 50 Beaumont Street, Canton, Mass. ARTHUR L. TOWNSEND, *Assistant Secretary*, Room 3-435, M. I. T., Cambridge, Mass.

1914

The annual Alumni Dinner was held at the Hotel Statler February 28. There was considerable speculation as to the probable success of this dinner, because of the fact that it was not a strictly Alumni affair, but guests were invited. As usually seems to be the case '14 went contrary to the general trend. While there were less Alumni present at the dinner than last year, '14 had more representatives than at any time for several years. There were present with their wives, Messrs. Crocker, Stump, Hamilton, Zecha, and Richmond. Thorn Dickinson, who has remained a bachelor, was also present and seemed to enjoy his independence most completely.

The regular monthly luncheon was held at the Engineers Club, March 4. Those attending were Fales, Horton, H. S. Wilkins, C. H. Wilkins, Crocker, Trufant, and Richmond.

One day recently while walking through his factory, your Secretary noticed a familiar figure nosing around inspecting machinery and looking for

1914 Continued

trouble in general. On approaching him, your Secretary found the inspector to be none other than Carl M. Berry, who is an engineer for the Insurance Company covering the plant. Aside from his insurance activities Berry is engaged in real estate enterprises, operating two large apartment blocks. Berry insists that his extra time occupation of being a real estate operator is both profitable and interesting. He said the running of apartment houses calls for every bit of engineering training learned at Technology. Berry has two daughters, six and four years old.

The announcement for the March 11 meeting of the Boston section of the Society of Mechanical Engineers, contains this statement: "Speaker Howard A. Morrison, chief engineer, Lever Bros. Company, — an interesting program of entertainment has been arranged." Just what the latter reference means is not quite clear. We all know that Boggs is a big man in the soap business. We also know that he is quite renowned for his performance of the one-armed flute player and the silent hunter. Just what kind of a show he put on at the A.S.M.E. meeting was not reported.

Welton A. Snow has crossed the continent from Florida to California. He is now located in Los Angeles, as the western representative of the Associated General Contractors of America, whose headquarters is in Washington, D. C. Snow writes that he has taken up Spanish, and is considering the possibilities of South American activities in the future.

Gardner Derry has returned from his European trip and has reported as follows: "I have just gotten back from my trip abroad and had a most pleasant time with friend Forbes. Through the kind efforts of Mrs. Forbes and he, I was able to do Paris and had a most interesting time of it. Forbes is with the Submarine Signal Company, as you know, and he has been in Paris now for three and a half years. He travels back and forth to America frequently and in addition covers most of the other countries.

"He is getting to be a great linguist because he talks most of the languages over there, due to his traveling about so much. In fact, he is on the water so much I think he has developed web feet. I had a very interesting trip covering a good part of Germany, through France, about two weeks in England and Scotland, and also through Belgium and Holland. Of course, this time of year is not the nicest time to visit these countries, but the conditions there at this particular time proved to be tremendously interesting. The conditions in Germany are in pretty bad shape. Right now, nearly 5,000,000 people out of 60,000,000 being out of work and the country being snowed under with very heavy taxes. However, they are assuming this burden with a splendid spirit and everywhere in Germany I was treated with the greatest consideration and courtesy.

"England is very hard hit of course, and is handicapped by their dole system which is proving to be an increasing

burden. The wage scale seems to be about as follows: Germany, 4/5 of England; France, 2/3 of England; and Belgium, even lower. The wage scale for the various classes of industry seem to be approximately half of ours here, or even lower, on a non-union basis. There are no apparent signs of suffering in the larger cities, but you do get these signs in the smaller cities and particularly in those industries such as coal, steel, and textile. There the situation is quite acute.

"I had an interesting trip on the *Europa*. This certainly is a marvelous boat to travel in comfort across the Atlantic. We had a very rough crossing back so that they operated at reduced speeds and consequently did not hold to anywhere near the record that they have established. Coming back it took us five days and approximately five hours, but it is hard to make time in fog and rough weather. The North German Lloyd Line are making a real attempt to recapture the trade and they seem to have been successful. Their service and food is beyond reproach. Of course, one of the chief attractions to those who come from the 'Land of the Free,' is the liquid refreshment, and one does not have to walk or stagger far before bumping into a bar. This section is well patronized and the only ceremony marked with a sigh of regret is when the keys of the various bars leave for the Captain when the Pilot comes aboard."

Gardner also writes that since we have been reporting on various patents issued to '14 men that have come to our notice, we should add the fact that he has had several granted on air heaters and economizers. We can understand the air heater patent being issued to '14 men, but the only economizers we have found in the Class were those who refused to pay their class dues, and Derry is not one of them.

While we have always considered them as '14 men, their official listing is of the Class of 1915. However, because of their many friends in 1914, the following news items regarding Leslie Fletcher, and George Whitwell are included in our notes: "'Guest Speaker' — R. Leslie Fletcher, engineer of the Providence Gas Company, was the guest speaker yesterday at the regular weekly luncheon meeting of the Vivitan Club in the Narragansett Hotel. Mr. Fletcher spoke on 'The Value of the Gas Industry to the Community.'" — *Providence Journal*, February 19.

"George E. Whitwell has been elected Vice-President in charge of sales of the Philadelphia Electric Company. He is now Vice-President in charge of sales and service of the Philadelphia Company and affiliated corporations of Pittsburgh, and will assume his new duties on April 1. On March 31, 1927, Mr. Whitwell was appointed general sales manager of Philadelphia Company, and on September 11, 1929, was elected Vice-President in charge of sales and service. He is a member of the National Electric Light Association, American Gas Association, Natural Gas Men's Association, Pennsylvania Electric Association, Electric League of Pitts-

burgh, and a number of Pittsburgh clubs and associations." *Philadelphia Evening Public Ledger*, March 2.

Just as these notes are being prepared, word comes that Porter Adams, who has been ill with pneumonia at a Daytona Beach (Florida) hospital, is out again and expects to return to Washington shortly. In his ever inimitable style Pat writes: "I am out of the hospital for the moment and the weather is fine here in Florida, both of which are world's records." — HAROLD B. RICHMOND, *Secretary*, 30 Swan Road, Winchester, Mass. GEORGE K. PERLEY, *Assistant Secretary*, 21 Vista Way, Port Washington, N. Y.

1915

Those of you who knew him when he was struggling for a degree will probably be interested to know that C. (for Clarence) Weare Howlett, X, formerly of Kokomo, Ind., and points west is now definitely located at The Converse Rubber Company, Malden, Mass. But for those of us around Boston this is a hard blow to take as we must suffer his presence among us. Hailed and known as "The Kokomo Flash" he is trying to conduct himself to substantiate that reputation. You know one definition of a flash is something that goes out quickly. At any rate, we've become tight friends with Weare — myself, particularly because I helped to put him through Course X and, I understand, Eddie Fonseca, VI, put him through high school. So, after much waiting and postponing, a reception was arranged and I met Mrs. Howlett, a charming and delightful lady and Betty, twelve years old and known as "The Kokomo Spark." The secretarial social duties continued with an enjoyable Sunday afternoon in Detroit with Gabe and Mrs. Hilton. Would that my efforts received the same support from the class as from the wives, for both Mrs. Howlett and Mrs. Hilton sympathized with me on the scarcity of our recent notes with some harsh exhortations. That's all I wanted to know!

So for material came the big evening of March 16, when we had our first dinner this year at the University Club, Boston. I am aroused and spurred on now to the New York dinner next month. To the dinner came: Frank Parsons, II, Fred Waters, II, Herb Swift, II, Arch Morrison, II, Chet Runels, IV, Newell (Reggie) Foster, X, Whit Brown, IV, John N. Dalton, X, Marshall (Jack) Dalton, I, Jac Sindler, X, Weare Howlett, X, Johnnie O'Brien, I, II, VI, X, Frank Scully, I, Louie Young, II, Abe Hamburg, XI, Henry Sheils, I, Carl Wood, I, Waldie Pike, I, George Rooney, I, and Azel Mack, X.

A grand and glorious gathering of 20 loyal and staunch supporters of our class with only a few of the regular attendants absent. After a hearty dinner at which "The Kokomo Flash" acquitted himself nobly as the refreshment committee, Carl Wood, I, showed his movies of the Marblehead and Swampscott reunions. Words fail me! Then Herb Swift, II, showed his movies of the Institute and

1915 Continued

City of Boston taken last summer from the Goodyear blimp. His interiors of the hydraulic and mechanical engineering labs at the Institute were excellent, remarkable photography and extremely interesting intensified by Herb's descriptions. You can appreciate this when I tell you we all applauded Herb. Then Frank Scully put on several reels of his recent Mediterranean cruise with Mrs. Scully. Enriched by Frank's stories and experiences these pictures held us with the color and romance of these intriguing foreign lands. Particularly impressive were the scenes of Marshal Foch's funeral in Paris. If you ever thought Frank funny playing second base at the reunion, you'd walk more than a mile for a camel with him precariously perched up between the humps. After the cheering and glasses cleared away, there followed some backgammon played according to our own rules. First we discarded the board, then the little round men and finally got down to the dice and the floor. Perhaps we had only the dice in the first place, but the game soon assumed big league proportions. I'd like to tell you the fellows who promoted that game and the loud croonings with which they courted the favors of Lady Luck but I hope some day to meet their wives. The finale was the bowling match, George Rooney, Abe Hamburg, Chet Runels and Reggie Foster rolling against Frank Parsons, Jac Sindler, Weare Howlett (The Kokomo Flash) and Frank Scully. I kept score, a thankless job, cursed alike by the losers and winners for favoritism in my arithmetical digressions. Ah, me! A number of bets were passed, but no one would dare say who really won. And so home and to bed.

Restricted as I am by my limited ability, I cannot possibly or properly tell you what a happy gathering this was. But I do feel that these years bringing us to the forties are also bringing us closer together with a new sentiment for our classmates. Friends now for 20 years we should go on into this next span of life with a better and closer feeling for one another, a desire for more intimate and more frequent contacts and a more compelling interest in our class. These will be the joys of our later years for Technology. The success and spontaneous enthusiasm of Marblehead and our dinner demands some sort of reunion intervening before the Twentieth. Have you any suggestions?

Already the returns for class dues are coming in welcome numbers. But all you who have not already sent in \$2.00 please be good enough to pay up. — AZEL W. MACK, *Secretary*, 379 Marlboro Street, Boston, Mass.

1916

Harold Whitney acted as host for a number of the class at his home in Watertown Saturday evening, March 14. As usual Harold outdid himself in making the guests feel at home, and a wonderful time was had by all. The occasion was a pre-get-together for the reunion in June. The following were present, and everyone promised to be present at Saybrook: Tom

Berrigan, Knight Owen, Santy Claussen, Nat Warshaw, Dick Hunneman, Bob Crosby, Harold Russell, Dave Patten, Ralph Fletcher, Tom McSweeney, Emory Kemp, Steve Barker, Harold Whitney, and yours truly.

In addition to the above I have been pleased to receive letters from the following, all of whom are planning to be with us at Saybrook: Cy Guething, Francis Stern, Bill Drummey, Don Webster, Saul Makepeace, Harold Gray, Leonard Besley, Chuck Loomis, Jimmy Evans, and Lawrence Delabarre. P. Pizarro and Herb Mendelson cannot say definitely at present whether they can come, but the chances are that they will be able to do so. The following found it necessary to send their regrets but I am relying upon their changing their minds the last minute: Henry Dursin, George Tuttle, Willard C. Brown, Robert A. Miller, James H. Murdough, Burkett D. Newton, Everett B. Johnson, Donald Dunn, and Joseph V. Meigs.

Mr. and Mrs. Charles W. Lawrence have a baby daughter, Leonice Nancy, born on March 10. Charlie's new address is 11 Evergreen Street, Kingston, Mass. He is superintendent of schools in a union of four towns: Kingston, Pembroke, Halifax, and Plympton.

Chuck Loomis in Detroit has just sent me the following most interesting letter from Murray Graff, who is now located with the General Electric Company in the Denver, Colo., office. "It hardly seems more than a week or so ago that you and I were cavorting on the cinder track at Tech Field, but actual computation indicates that it was 13 or 14 years ago. I have thought of you a good many times since I left Tech, and inasmuch as I had a little news which I thought would be of interest for The Technology Review, I decided to kill two birds with one stone and give you the story and also let you know that I had not forgotten you.

"On February 10, I met Arthur Hill, a Tech man, just before lunch, and he inquired as to whether I expected to attend the Engineers' luncheon at noon. I told him I had considered it, and he said he thought we should go over, as a Boston Tech man was to give the talk, in fact it was the man who was to make the address at the Engineers' Day celebration at the Colorado School of Mines on the following Thursday. At the luncheon that noon, Mr. Hill, Mr. Moody, Mr. Bosworth, Mr. Fox, a Mr. Waterman, and myself made up a table of Tech men. Much to my surprise and elation, I found the speaker of the day to be none other than Joe Barker, Class of '16 and Course VI. Joe, as you know, is now Dean of Engineering at Columbia University, which indicates that he has made very fine progress since he left school. Joe addressed the Columbia Alumni at the University Club as well as his address at the School of Mines and at the Engineers' luncheon, and in every case was extremely well received. Joe managed to get away from his various duties on Wednesday, and we had quite a reunion.

"With the exception of nine months in the army, and about a year with a consulting engineer in Denver, the rest of my time has been put in with the Westinghouse Electric and Manufacturing Company and the General Electric Company. I left the Westinghouse Electric about two years ago and have been with the General Electric Company ever since. The General Electric Company is a very wonderful corporation to work for and I am thoroughly enjoying my work as sales engineer."

The *Engineers' Bulletin* which is the official organ of the Colorado Society of Engineers gives Joe Barker the following write up: "Dean Barker is a magnetic young man, possessed of great energy, a pleasing personality and a new philosophy relative to the larger functions of the engineer. His address, entitled 'The Engineer in Present Day Civilization' will long be remembered as a lucid presentation of an ideal. He defined this ideal of engineering as more of a cultural influence than merely the direction and domination of the forces of nature for the good of man's physical well-being. He left no doubt in the thought of his listeners about the responsibility of the engineering profession for present conditions of over production, nor the duty of the engineer in the work of correcting these conditions." — HENRY B. SHEPARD, *Secretary*, 269 Highland Street, West Newton, Mass. CHARLES W. LOOMIS, *Assistant Secretary*, 7338 Woodward Avenue, Detroit, Mich.

1917

Philip N. Rowe, who is with the firm of Phillips and Rowe, Inc., shellac brokers, in New York City, reports that business has been fairly good with them during the past year, and they have been making a good living even during the depression. They secured a while ago a very active London shellac representation, which completed the triangle comprised of Calcutta, New York, and London.

Leon McGrady has joined forces with the "mysterious Mr. Smith" at Rochester. He has been there but a comparatively short time and we have had no direct word as to how Mac likes the kodak business or as to exactly what he is doing there. I suppose that when he gets duly acclimated, he will send a long letter that can be printed here. — John Holton has moved to Newark, N. J. The move was caused by the merger of the Carrier-York interests and as might have been expected, has given him a larger opportunity. At present he is serving as one of the three heads of research for Carrier-York.

Edward P. Warner's press clipping bill must be a heavy one. When he cannot think of any other way to get into the newspapers, he goes and gets married. These notes are hardly complete without some item about him, but seldom have we been able to give as excellent a résumé of his many activities as appears in the following clipping from one of the Boston papers. "Miss Mary Jane Potter,

1917 Continued

daughter of Mrs. William H. Potter of 5 Chestnut Street, was married to Edward Pearson Warner of New York, professor of Aeronautical Engineering at the Massachusetts Institute of Technology, at Leyden Congregational Church, Brookline, yesterday. The bridegroom was Assistant Secretary of the Navy for Aeronautics under President Coolidge. After a short ocean trip, Professor and Mrs. Warner will live at 40 Fifth Avenue, New York City.

"The bride became a member of the Junior League in the season of 1920-21, and was graduated from Windsor School and attended Vassar College. Professor Warner is the son of Mrs. Anne Pearson Warner and the late Robert Lyon Warner and was graduated from Harvard College in 1916. While studying at M. I. T. for his Bachelor's and Master's degree in science, which he obtained in 1917 and 1919, he was an instructor in aeronautical engineering in the same institution. Later he entered the government service.

"From 1919 to 1920 he was chief physicist for the National Advisory Committee for Aeronautics. In 1920 he served in Europe as technical attaché of the N.A.C.A. He returned to Cambridge as associate professor of aeronautical engineering in 1920 and was appointed a full professor in 1924. He was chairman of the Massachusetts State Board of Aeronautics from 1922 to 1926 and at one time was chairman of the Boston municipal air board. He is a writer and lecturer on scientific and educational subjects and is a member of several technical societies. He is also a member of the Harvard and University Clubs of Boston, the Cosmos Club of Washington, D. C., and the Town Hall Club of New York." — RAYMOND S. STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

1918

Via the unofficial person-to-person telegraph the news has reached us that Jack Kennard has a new son, whether a late 1930 or early 1931 model we do not know. That makes two for Jack: the sweetest little daughter that ever toddled across an apartment foyer, and now the makings of the two ends and the middle of a man.

Also via Mrs. Grundy and the Margaret Cheney Room we hear that our statement of last fall concerning the group that went to the Yale-Harvard game and the scrumptious lunch that sustained them during the battle was open to criticism. Half truths are dangerous and we gave a whole paragraph of praise to the "lady who put up the lunch." Well, there were two of them, and because it has been our delightful privilege to eat waffles by the cord wood measure, to drink cocoa in tank car lots, and to gedunk our doughnuts to our official heart's content at the generous table of the unmentioned collaborator on that red and blue lunch — we hereby offer our most polite apologies.

A letter from Sax Fletcher, bold in engraved heading and shouting to an enlightened public the name on the Vice-

President's door, says that he has not been very successful in getting to the New York Class luncheons this year due to the pressure of business (cheerful news, that) but that he certainly does expect his friends (including, sez he, an erring Class Secretary) to drop in to see him whenever visiting the big city. Address Ross Engineering Corporation, Chanin Building opposite the Grand Central. — Richard Smith, to whom we made a well-deserved polite bow in these columns only recently, is being sent to Europe in May by the Institute for nearly five months of study in Germany, once more illustrating the fact that those who have brains achieve opportunities to cultivate them. — F. ALEXANDER MAGOUN, *Secretary*, Room 5-328, M. I. T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, 7338 Woodward Avenue, Detroit, Mich.

1920

Lt. Commander Gordon W. Nelson of the U. S. Construction Corps married Miss Lucille Kennard, daughter of Dr. Louis W. Kennard, 41 West 96th Street, New York, on February 21. — This is the sum total of news received within the past 30 days. I am not ashamed of the glaring paucity of notes for 1920 but you, gentle reader, ought to be. — HAROLD BUGBEE, *Secretary*, 9 Chandler Road, West Medford, Mass.

1921

Reunion, ahoy! Thar she be, straight ahead and only a month away. Your Asec is not going to steal the thunder of our Ten-Year Reunion Committee and divulge in detail their plans for the Big Days. In answer to the many queries which have come in from members of the Class let it suffice for the present that there is to be a Class Reunion this June. The Committee has intimated that it will be a stag affair, probably around the week-end of June 12, 13, and 14 in a location somewhere between Boston and New York, said location hinted to be an ideal spot on the Sound. All this information is contained in a special Ten-Year Reunion notice now being mailed to the whole Class.

Topping the list of long distance appeals for information on the coming reunion is a letter from Old Man Kilovolt Ampere (Himself), alias Harry P. Field, VI, of the Hawaiian Electric Company, Limited. Writing from 49 Kawanakoa Drive, Honolulu, Harry says, in part, "I have just decided to take a trip back East to the National Electric Light Association convention at Atlantic City, June 8 to 12, and will run up to Boston for the reunion." He concludes with an itinerary which reads like a Raymond and Whitcomb advertisement, and says he is going to look up some of the boys on the way. Harry asks if Harold Cake will be at the reunion or if he will have to journey all the way to Portland to get a glimpse of this august personage. How about it, Cookie? (Note for Reunion Committee: save a front seat for the bronzed gentleman with the lei!)

Hope you voted for J. R. Cudworth, XII, the "People's Choice" for Representative-at-Large of the Alumni Association. We trust the many votes we swung your way, Jimmie, will serve as a tidal wave to sweep you into office by an overwhelming majority; of course, we expect some remuneration for our electioneering services and same will be most acceptable in the form of a letter to your Asec for publication in these columns, together with a sworn statement of your intention to be at the reunion in June. While we do not yet know if Jimmie is now a representative, we have it on good authority that he is Associate Professor of Mining Engineering and Acting Director, School of Mines, University of Alabama, and is still "at large."

Anent the politico-alumnus situation, we observe, in passing, the names of those members of the Class now serving the Alumni Association in various capacities, Walter J. Hamburger, II, who is resident manager of the Interstate Division of the Robert Gair Company, 75 Front Street, Brooklyn, New York, is serving on the Tech Show Committee of the Advisory Council for Undergraduate Activities. Dr. Manuel S. Vallarta, XIV, who is Assistant Professor of Physics at Technology, is again the representative of the Technology Club of Mexico on the Council of the Alumni Association. Two members of the Class are acting as presidents of their local alumni clubs. Samuel P. Mills, Aeronautical Engineering, is President of the Dayton Technology Association. Sam is a First Lieutenant, Air Corps, U. S. A., stationed at Wright Field, Dayton, Ohio. Edward F. Praetz, II, is President of the Technology Club of the Merrimack Valley. Pretzel is an instructor in mechanical drawing in the Lawrence High School where he prepared for Technology.

Turning now from the politicians to the literati, we find three members of the Class breaking forth, figuratively speaking, into Spring verse along strictly technical lines. The *General Electric Review* for February, 1931, contains Part II of an article by R. D. ("Lackawanna") Booth, '20, and O. G. C. Dahl, VI, entitled, "Power System Stability. A Non-Mathematical Review." As previously noted, Part I of this article appeared in the December, 1930, issue of the same journal. Otto is Associate Professor of Electric Power Transmission at the Institute and Ralph is a member of the firm of Jackson and Moreland. — Dr. Charles H. Herty, Jr., X, X-A, in collaboration with Jay E. Jacobs, '19, presented a paper on "Clean Steels from Acid Open Hearth," at the Western Metal Congress, an abstract of which appears in the February, 1931, issue of *Metal Progress*. Charlie is Supervising Metallurgist, U. S. Bureau of Mines, 4800 Forbes Street, Pittsburgh, Pa.

A joint paper of A. B. Kinzel, IX-B, and Walter Crafts, '26, entitled, "Inclusions and Their Effect on Impact Strength of Steel," appeared in the issue of *Iron Age* for March 5, 1931. Gus and Walter are both metallurgists in the Union Carbide

1921 Continued

and Carbon Research Laboratories, Thompson Avenue and Manley Street, Long Island City, N. Y. — H. R. Kurth, VI, F. W. Binns, X, and L. C. Pelkus, X, were among the '21 men at the Annual Dinner in Boston, February 28. — E. I. Mandell, I, of Duncan and Mandell, has announced a change in address to 650 Main Street, Hartford, Conn., where his firm will continue the practice of surveying and handle land development projects.

Friday, March 13, was our lucky day, being the occasion of a call from H. D. Griswold, XV, who was on an official visit to the Bell Telephone Laboratories. Then Lieut., who never does things by halves, ran up to South Manchester to drop in on Ray. Deane is Assistant Treasurer of the Griswoldville Manufacturing Company, Griswoldville, Mass., with whom he has been associated since our graduation. His work is mainly along manufacturing and technical sales lines. He is married and has two youngsters, a boy of four years and a girl of 15 months. — Mr. and Mrs. Sumner Hayward, X, announce the arrival of Priscilla Hayward on February 18, 1931. The Haywards also have a boy who is now over two years old. We haven't seen Sumner since he left our Manhattan Isle to take the engineering of the toll cable plant for the New York Telephone Company way over yonder in Brooklyn at 81 Willoughby Street. How about a lunch date?

Rumor hath it that R. E. Waterman, X, is contemplating the purchase of a luxurious new Packard. Well, it's a good car! Bob is now located at the new Summit, N. J., chemical research laboratories of the Bell Telephone Laboratories. — Your Asec has moved from East Orange and is now living on Dunbar Street, Chatham Manor, Chatham, N. J., Telephone Chatham 4-3689-W. We are near Route 24 which runs through Morristown, N. J., and will be glad to have all '21 men living in the vicinity or driving through drop in and see us.

See you all at the Big Tenth! — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Co., South Manchester, Conn. CAROLE A. CLARK, *Assistant Secretary*, Room 661, 11 Broadway, New York, N. Y.

1922

Twelve months hence we will be completing our plans for the Tenth Reunion. How successful a get-together we enjoy will depend to a large extent not on Heinie and his Committee, but on each of us individually. Make a mental note that three days in early June, 1932, must be reserved for renewing old acquaintance and a big step toward the success of the reunion will have been taken.

The party at Falmouth spoke for itself — good planning by the Committee and a grand turnout (175, wasn't it?) together set a mark for future similar celebrations. Matt Taylor in Rochester, Fergie Ferguson in Buffalo, and many others seen recently have spoken of the fact that they realize that they must plan long in advance to be sure of being pres-

ent. Where the reunion will be held, what will be done, and how long it will last are questions that will be answered soon. If you have ideas or suggestions, send them in. They will be considered carefully and, who knows, your hunch may be the best we'll have. Give your thought box a chance to work. Team work counts.

How many letters do you think we have had since the last notes went to The Review? You are wrong; we didn't pull a zero, for Mal Fisher wrote as follows when the Alumni Dinner was held at Boston: "In reply to your announcement of the Annual Dinner, I sincerely regret that I cannot leave Craig Colony and be with you. I assure you that I will be with you in spirit. It might be of some small interest to you to know that the Colonists Club which is the club made up of the male patients here, elected me to the office of President for this year. We took office at the January meeting and last evening was the first regular monthly meeting for me to preside at. All seems to have gone well, and here's hoping."

Yardley and Mrs. Chittick announce the arrival of their second son, John Morgan, weight 8¼ pounds, on February 14, in Washington, D. C. — A clipping from the Denver (Colo.) *News* reads as follows: "The marriage of George P. Schumacker, Jr., son of Dr. and Mrs. G. P. Schumacker of Denver, and Miss Doris Peck of Cleveland, was announced here yesterday. Miss Peck is a niece of Dr. Grant S. Peck and Schuyler C. Peck of Denver. Schumacker is employed in Cleveland by an engineering firm. He is a graduate of East High School here and of the Massachusetts Institute of Technology, and a member of Delta Kappa Epsilon fraternity."

Another clipping from New York reads: "Mr. and Mrs. Robert H. Charlton, of 7 Tanglewyde Avenue, Bronxville, N. Y., announce the engagement of their daughter, Miss Edna Charlton, to Mr. James W. D. Archibald, also of Bronxville, at a luncheon-bridge given at their home. Miss Charlton is a graduate of Smith College and was formerly on the staff of the New York *Herald Tribune*. Mr. Archibald was graduated from the Massachusetts Institute of Technology." — RAYMOND C. RUNDLETT, *Secretary*, The Curtis Publishing Company, Lincoln Building, New York, N. Y.

1923

I can't believe that so little is happening to '23 men. The address changes reported indicate some activity. For example Cecil H. Green, VI-A, formerly of Dallas, Texas, has moved to Stillwater, Okla.; Alfred Perlman, XV, from Koote-nai, Idaho to Sandpoint, Idaho, where he may be addressed care of the Northern Pacific Railway; and Bill Searles, IV, from Dubuque, Iowa, to St. Paul, Minn. Most of the other changes do not involve any radical geographical movement, but I'll be willing to bet that some of them mean that this fellow has gone and got a new job and that he has got married or a bigger family or something which by rights should be put in these notes.

A number of you have thoughtfully put the class Secretary on your list for engagement, wedding, and birth notices. If all you would squelch any feelings of modesty about such matters it may be that we could make something of our vital statistics department. It's certainly in a bad way at present and I'm quite discouraged about it. The immediate feeling of discouragement may, of course, be partly due to the fact that these notes are being written in a hotel in Portsmouth, Ohio, on a rainy Sunday in March with only one concrete item to report before me.

That item is a clipping from the New York *Post* describing the announcement on February 16 by Dr. S. Lawrence Bigelow of the University of Michigan of the engagement of his daughter, Anne, to Daniel G. B. Thompson, XII. The clipping, which is from the society page, goes in liberal detail into the family background of both Thompson and his fiancée, but does not give us much other information. My latest record has it that Thompson is Director of Publicity for the Federal Seaboard Terra Cotta Corporation in New York City.

In past years the class has chipped in \$50.00 to the Alumni Athletic Fund. This year we have not done so because of lack of funds for the purpose. Dr. Allan W. Rowe '01, Chairman of the Alumni Athletic Council, has written Bob Hendrie and me about this several times, but I have not acknowledged his appeals thinking that we might any time now make a general request to the members of the class for contributions. We did this a few years ago and the response enabled us to make several annual contributions of \$50.00 each. This year the council is experiencing more than usual difficulty in raising their really very modest budget. Since nearly everybody has been impressed, if they have not actually felt, that times were not as prosperous as they should be, your class officers have procrastinated in making any formal appeal. Also the expense of writing every member of the class is considerable. In lieu of this I have therefore the suggestion to make that a few of you who may have as much as \$10.00 to spare, send me a check for that amount. I'll be glad to chip in \$10.00 myself so it will only take four others doing the same to make it possible for us to make the usual contribution on which the council more or less depends. — HORATIO L. BOND, *Secretary*, 31 Concord Avenue, Cambridge, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, Room 661, 11 Broadway, New York, N. Y.

1924

Excitement to one member of the Class. Late in December, Hugh M. Craigie, now with the American Smelting and Refining Company, was kidnapped by a band of Mexican bandits in Santa Barbara, Chihuahua, about 350 miles south of El Paso, Texas. It was the first affair in that section since the revolutionary days of 1916. Federal mounted troops were sent after the kidnappers but Craigie escaped from the mountainous rendezvous before their arrival. Very

1924 Continued

few details are available. Perhaps we will have them later as Hugh is a correspondent of Professor Locke. The following are excerpts from a letter which he wrote before his eventful experience. "... I imagine that I had better give you my history for the last few years. I last saw Boston in July, 1925. Since then I have put in six months underground in Bisbee with the Copper Queen, then nine months as engineer at Pilaes de Nacozari, Sonora, and finally I returned here (Chihuahua, Mexico) in November, 1926, and have been here ever since. I am foreman of the Tecolotes and Hedelgo mines here, getting out 35 thousand tons a month and scratching all the time to make it. Sometimes it seems like a tough life, but I enjoy it. I got married in 1927 and have a baby girl now a year and a half old. I expect that the other M.I.T. men here have kept you in touch with this place, but in case that they haven't, we have with us in addition to Mr. Lord, the following: Phelps, Weiss, and Walker. Regards to J. Weston Pratt."

On Tuesday, February 17, Frank Barrett was married to Miss Katherine Dorothea Wells of West Medford, Mass. On the fourteenth of the same month Charlie Phelps was married to Miss Ann Paulding Naile of Philadelphia. We extend our best wishes to them both. And to Bill Messer we are storing up our good intentions to the day he marries Miss Marian Ella Currier of Concord, N. H., their engagement having been recently announced. Bill is with the United States Rubber Company in their chemical laboratories at Naugatuck, Conn. My last piece of family information is the announcement of the birth of a son, Webster B., Jr., on January 31, to Mr. and Mrs. Brockelman.

On March 7 the Technology Club of Hartford was honored by having both President Compton and Dean Lobdell as guests. At that time 96 Tech men were in attendance and I saw more '24 men together than I have seen since the time of our Five-Year Reunion. Walter Weeks, Secretary of the New Haven Club, was present. Charles Duevel came from Norwich where he is now with the American Thermos Bottle Company. Henry Simonds came from Bristol, leaving the New Departure Ball Bearing Company long enough to be with us. He tells me that Ray Brink '23, is also with them in charge of the research laboratory. On a trip to New York recently he reports that he saw many '24 men, among them Howell Brown and Felix Stapleton. Henry is a mine of information, telling me that Sargent Heath is working in a woolen mill in Hillsborough, N. H., and that Lee Franke has a second youngster, another boy.

From Bill Correale I have a letter containing items of interest. For six weeks early this year he was assisting in the design of a shield for a new vehicular tunnel under the Scheldt River in Antwerp. In the latter part of last year he was assisting his own employer, who was a member of the Marketing Board of the St. Lawrence Power Development Com-

mission of the State of New York, thereby taking quite a course in the principles of the transmission and distribution of power. This year's party, held in New York February 14 by the classes of 1923, 1924, and 1925, was every bit as good and in some respects better than last year's. Bill Coleman was ring master, top hat and all. And there were no casualties. Among those present were: Anatole Gruehr, Roland Block, Bill Coleman, George Arapakis, Ed Wininger, Ted Simonton, Bill Sturdy, Walt Gress, Henry Shore, Dick Lassiter, Jack McCoy, Frank Di Somma '25, and Bill Correale. They expect to hold another next year although there is quite some agitation to have another this year.

The following letter is from George E. Lamb, who took graduate work with us: "I have been selected by the War Department as the Officer in Charge for the construction of a new military fort at Shreveport, Ga. It will be known as Barksdale Field and will be the largest aviation combat field in the world. The citizens of Shreveport have raised funds in excess of a million and a half dollars for the purchase of over 22,000 acres of land. The estimated cost of the entire project is eight million dollars. Buildings and utilities will be constructed for 50 pursuit planes, 52 bombing planes, quarters for 250 officers with their families, and barracks for 1,600 enlisted men. I have taken with me a chief engineer and a chief clerk. The remaining personnel will be recruited from Civil Service eligibles. Practically all work will be done by contract."

From Douglas Montgomery, VI-A: "For a year, lacking some three weeks at this writing, I have been here in Buenos Aires District. My main course of living has been to keep 18 to 38 moving picture installations with the "company" voices in any one or all of these languages: Spanish, French, English, German. Needless to say, this has been thrilling and has kept all of the nights and many of the days well filled. As relishes and spices we have had the forerunner and aftermath of a Revolution, as well as the event itself, bombings, operation of martial law, 'Chicago tactics,' low exchange rate, business depression, and the parent of the summer weather of Boston. As an after dinner course is the fact of being in a really foreign location and having a foreign language (even though it is the easiest and most beautiful Spanish) to live with and by."

I couldn't do any better than to end up with a letter from Bill Robinson. "... You say that you have permission to print some scandal which you heard of me. I don't recall any permission, but if it pertains to my taking the high dive into the matrimonial abyss, I would like to state that the report is grossly exaggerated. I am still devoted to rounding up that steadily decreasing band of classmates who are not privileged to claim exemption on their income tax for immediate family dependents. You hint that the scandal pertains to umpiring a baseball game, and that it would be safer to

play rather than umpire if my decisions were more just than tactful. I have never umpired a ball game, which I think is the most tactful decision of all.

"Business called me to New York last week, and I was fortunate to round up four classmates after five o'clock. There were present Earl Bates, Archie Carothers '25, and Bill Delehanty. The meeting was an enjoyable reunion, and we swapped lies for an evening. As you may know Earl Bates caused so much trouble for the big company which sells seam face granite that the other fellow bought him out at his price, made him a director of the big company, and a representative in New York City. Archie Carothers after traveling all over the country has decided to favor Altmans with his services. You will recall Altmans as that great New York department store on Fifth Avenue which does not display its name in any form on the outside of the building. My hunch is that with the acquisition of Brother Carothers (shades of the Church-like meetings of the Institute Committee in 1924) that there will be still less reason for displaying their name either inside or outside the building. — Bill Delehanty is a rising young architect in New York City, and has been fortunate in being connected with some big developments recently which are keeping him busy. I am glad he is busy because I won't be able to take advantage of his offer a little while ago to design a home for me when the occasion arose.

"Friends of Earle Wild will be glad to know that he is not a recluse, but is a load despatcher for the Commonwealth Edison Company in Chicago. I learned, not from Earle, that he is making out very well with Mr. Insull's company. Fremont Latham '25, is also following his principles of electrical engineering in the contracting business in Chicago. There are located in Schenectady some more or less famous Technology alumni, including a present and former member of the Corporation, and many who sign doctor before their names and many initials after their names. So the Technology group of Schenectady includes these notables, but the President is none other than Ed Hanley of our Class. The meetings here are very enjoyable. It was our pleasure recently to entertain Colonel Locke, who is in charge of personnel work for the Institute. At the next meeting, Vice-President Burroughs of the General Electric Company and a Technology alumnus, will address us. Ed is on the Manager's staff of the Schenectady Works, and recently addressed the Manufacturing Committee for the Company on the subject of Factory Costs. Ed performs a very useful function for the Commercial Department in having the factory figure their costs on a fair basis, and also showing how they can be reduced so that more business will be obtained.

"It was my privilege to travel for four months last summer through several states in the Middle West. Everyone I met who was present at the '24 Five Year Reunion spoke of the most enjoyable

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time which they had there with us at the Corinthian Yacht Club in Marblehead. Those who were not present in 1929 are anticipating making up for lost time when 1934 and our Ten-Year Reunion rolls around. Until then the thought I would like to suggest is that you keep up and make wider your Class of 1924 connections. You will be the gainer. P.S. Hal didn't ask me to make this request, but I don't believe he would refuse a letter from you. How about bending that right elbow to accomplish a horizontal motion across a letter, and then so as not to get out of practice return to the vertical motion of transmitting other 'spirit' to your lips." — HAROLD G. DONOVAN, *General Secretary*, 372 West Preston Street, Hartford, Conn.

1926

In this *feuilleton* last month we promised to reveal the spot chosen for the class's Dionysian rites to be celebrated on June 6 and 7. That promise, gentlemen, we faithfully keep. The Mayflower Inn, south of Plymouth, has been selected.

It is a gorgeous place for the class's first reunion. The Inn can accommodate as many as 200 and situated as it is on Manomet Point, it offers every facility that such a reunion demands. A golf course is adjacent to the hotel; there is a fine outdoor swimming pool for those who find the nearby beach too frigid; and there are tennis courts and provisions for still other forms of sport. The transportation committee expects to provide bus transportation from Boston.

The returns to the letter recently sent out to all members of the class have been gratifying. More than 100 have replied and more responses are coming in every day. There is an absolute maximum which can be accommodated at the hotel and reservations will be filled in the order of their receipt. All those who are suffering from claustrophobia, all whose duodenums have been shriveling up because of low humidity, all whose gregarious instinct needs a work-out, all those who need a two-day respite from the rigors of Hoover prosperity — all of you, gentlemen, who fall within these categories had better send in your card, seek absolution, and go in training. No one need say they were not warned.

Dave Shepard is not the only member of the class who possesses histrionic ability and who has opportunity to exercise it. Clippings are at hand describing the performance of G. Warren Hamblet, Jr., together with his wife in a recent production of "Is Zat So" in Lawrence, Mass. Mr. and Mrs. Hamblet, we take it, are doing an Alfred Lunt and Lynn Fontanne. It only remains for Hamblet to do Hamlet.

Perhaps Shepard and Hamblet, together with others unknown to us, will bring their cap and bells to the reunion and give us a performance.

It should be most emphatically a Falstaffian performance, nothing lugubrious or problematic. By the late hours of the evening of June 6 it is safe to prophesy that many members of the class

will have a brighter light upon their noses than did Bardolph — you remember, of course, Shakespeare's character and Falstaff's friend whose nose made lights unnecessary. In fact before dawn on June 7, the Mayflower Inn should be the scene of Light's Second Golden Jubilee — a remarkable demonstration of nasal bio-luminescence.

Der Konvergenzpunkt recently received a letter from Doug Jeppe who now resides in Varnville, S. C. He was married in 1929 to Miss Alice Watson, one time Emerson student, and he has been working in South Carolina except for an interlude occupied by a trip with his wife to his home in South Africa. Part of the time he has been working on the Saluda River Hydro-Electric Development and now he is employed with the South Carolina State Highway Department.

The Secretary regrets to announce that Delbert Cross died on January 24, 1931. The cause of his death was a fractured skull and brain hemorrhages resulting from a ski spill. He died in the Toronto General Hospital one week after the accident.

Members of the class will recall Horace Burt, better known as Jeff, and one time editor of *The Tech*. Jeff disappeared while visiting in Denver, Colo., on July 31, 1928, and his family has not been able to find any trace of him since. Should any member of the class hear anything about Jeff whatsoever, please communicate with the Secretary — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M. I. T., Cambridge, Mass.

COURSE VI-A

Not so long ago I had the pleasure of eating with Grueter as I occasionally do and heard all about his galavanting around the countryside last fall. It turned out we missed each other in Minneapolis by about a week. — Also the fog cleared away and Hank Shore appeared close at hand. Remember him up in the Research lab. around thesis time? He sure was a friend indeed to me during those trying times as well as to many of the rest of us. I gathered Hank unto myself one evening and was completely distracted from social, business, financial or any other worries. I trust the good time was mutual. From Hank I hear various bits of gossip from here and there amongst which was tidings of our friend Dave Shepard. It seems they live in the same apartment building.

I sure hope that a large number of our gang will be present at that secluded inn on Cape Cod next June to renew friendships once more. Five years pass quickly and we will be getting old before we know it, so let's grab off a bit of pleasure in life and increase our bounty of friendships which makes our lives either barren or full. Hope to see you there. — BENJAMIN P. RICHARDSON, JR., *Secretary*, 29 South 2nd Avenue, Mt. Vernon, N. Y.

COURSE VI

Up in Portland here, where I am acting as nursemaid to a group of theatres equipped with the Western Electric Sound System, I don't run across many of

the old gang. I rub shoulders occasionally with Larry Cummings '26 who is an engineer for the Paramount-Publix Corporation and last summer while engaging in a little golf on Chebeague Island in Portland harbor, I ran into Professor Passano who has a summer cottage on the island. That constitutes all of the contact I have made up here. I guess most of the fellows manage to keep south of Boston.

I spent two weeks in New York recently in connection with the little problem of exterminating all extraneous noises from the Western Electric Sound System and while there had the opportunity of comparing notes with Toby DeNapoli and J. E. L. Tweeddale, who are with the same company. Toby is in the complaint department and his motto is "no complaints in 1931." He is busily engaged in devising all sorts of queer gadgets and contrivances for the elimination of complaints before they arise. In addition to this I found him perfecting a trick ping-pong serve which promises to make him amateur ping-pong champion of the city.

Tweeddale is in the acoustic department and at the time of my visit was engaged in a study of noises in the New York subways and their suppression. Although in the city for two weeks I did not have an opportunity to look up any of the old crowd inasmuch as my schedule called for lectures from 7 to 10 in the evening followed by work in some of Broadway's theatres from 11 until 9 the next morning, the remaining hours of the day being devoted to concentrated sleep in the nearest hotel. However, I would like to hear from all of you and promise to look as many up as possible on my next trip.

I have a couple of newspaper clippings here announcing engagements of interest. "Mr. and Mrs. Ivanhoe H. Sclater of Pittsfield, Mass., announce the engagement of their daughter, Miss Virginia Sclater, to Harland Perry Sisk. Miss Sclater is a member of the Class of 1931 at the University of Virginia." — From Beverly, Mass., we hear that "Mrs. Fannie Michelson announces the engagement of her daughter Miss Rebecca Michelson to Myer Gorfinkle. Miss Michelson is a graduate of the College of Business Administration of Boston University." By the time this appears in print perhaps both Harland and Red will have joined the ranks of the safely married, but congratulations, fellows, on the steps you have taken or are about to take.

I hope that some of you may see fit to drop me a line and renew old acquaintances. As I said before we really owe it to the world to tell them how we did it so don't be modest. — CHARLES A. BARTLETT, *Secretary*, 61 Deering Street, Portland, Maine.

1928

To be properly truthful, the division of this monthly Cupid's section of the classnotes for '28 should best be arranged in the usual order of betrothals, bridals, and babies. We have other news, of course, but that pertaining to the three "B's" is

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most interesting and comes foremost because it has that highly tooted quality of sex appeal.

The first "B" section is, of course, dedicated to betrothals and this month we have the honor of announcing the engagement of Frank G. Webster to Miss Helen S. Talbot. No wedding plans have yet been announced, but we extend our respective congratulations and best wishes to the couple. — Double congratulation is due Harry Cade of Course IV-A. First because of the recent announcement of his engagement to Miss Nettie Burr Davis of Hingham, Mass. Miss Davis is a teacher in the Hingham schools at present and a graduate of Radcliffe College. Second, we have just recently heard of an announcement in the *Boston Transcript* that Cade is now at the head of the Berkeley Preparatory School in Boston.

The engagement of E. Vernon Lewis of Course X and Miss Helen A. Bonser of South Hadley, Mass., has just been announced. Vernon has fulfilled requirements for a Doctor of Philosophy in chemical engineering and he is now a research chemist for the du Pont Rayon Company at Buffalo, N. Y. Miss Bonser is now an instructor of economics at Mount Holyoke College from which she obtained her Master's degree in 1929.

Our second "B" section, allotted to bridals, has much more information and it gives us much pleasure to announce the marriage of the following group of 1928 men. Miss Dorothy Jackson became Mrs. Kenneth C. Hawthorne at a very attractive wedding in St. John's Episcopal Church at La Salle, Ill. Kenneth is now working with the Western Clock Company. — Trinity Church in Newton Centre was the scene of the Jennings-Sawin wedding. The Class of '28 extends its congratulations to Ken Sawin and best wishes to his bride. — The St. Louis Star carried quite a full account of the marriage of Miss Medora Steedman of that city to George E. Bass. George is assistant manager of the Commonwealth Sales Corporation in Paris. He and his bride sailed for France soon after the wedding. — Miss Faith D. Wells and Wentworth Taber were married at Riverhead, Long Island, late last year. The news has just reached us and our congratulations are therefore quite late but all the more hearty.

Our third "B" stands for babies and in this section we have news of two new '28 juniors to make we of the remaining last battalion of bachelors seem all the older. — The Prescott (Ariz.) *Courier* carried a news article headed "Harold Block is Daddy" which said "Harold Block, younger son of Mr. and Mrs. Ed Block of Prescott, has informed his parents of a daughter, born in his Cleveland home on the morning of January 15. When the proud father obtained his second degree from the Massachusetts Institute of Technology, he accepted a position with the research bureau, Cleveland section, of the Aluminum Company of America and has been with this company continuously

since." To daddy Block we extend congratulations! — "Everyone says that Miss Joan De Camp, aged three months, is the image of her old man," (meaning George Moon De Camp) according to a news dispatch from Providence where George is working in the plant engineer's office of the Gorham Manufacturing Company. George has something in store for Joe Parks for he suggests that we get a hold of Joe and "blow him up for me." During a recent trip to Newport and Providence we dropped in to see George and the family but the De Camps were conspicuous by their absence.

According to latest reports Jerry Brickett and Johnny Reynders are still holding out on their famous Scotch five dollar bet that the other would marry first. We'll bet Johnny loses because these silent boys are hard on the women when they get going. Dean Batchelder has jumped from general engineering with Westinghouse to teaching principles of A. C. at Colorado State Agricultural College at Fort Collins, Colo. Dean says he expects to locate a new teaching job after this year unless he "weakens to the call of the west and goes in for ranching." Dean reports that Max Parshall, V, is also at Colorado State. Max and Dean have been attending the Denver M. I. T. Club's meetings and say they are most enjoyable. He also says he is a member of the Colorado Mountain Club and has been all through Rocky Mountain National Park and has climbed Long's Peak and skied in the Medicine Bow Range.

The following is an excerpt from a letter received from Hector E. Hagedorn: "Am leaving the States for an extended tour of the Mediterranean and Europe. Will be away for about a year or two. Leaving N. Y. C. on March 4 for the Med. and after spending six weeks along those beautiful shores, will start rambling through Spain, France, Germany, Russia, and down to Austria and Italy. This will probably take about a year, after which I propose to visit India, Siam and the Malay Islands on my way to Manila." Hagedorn's address will be: P. O. Box 782, Manila, P. I. — GEORGE I. CHATFIELD, *General Secretary*, 420 Memorial Drive, Cambridge, Mass.

COURSE XIV

With the advent of the very successful circulating class letter it has not been necessary for frequent notes in the Review. However, some of the fellows outside of our class may be interested in knowing what we are doing so we are quoting directly from the last class letter.

"Married for two years and not a scene yet! I recommend to all the married state. Am now in Oakville, Calif., drinking the cows dry." — "I am still learning how to keep 'The New Haven Road' just rolling along." — *Paige*.

Harlan came down to Wilmington on March 8 and we spent a very enjoyable day together. Harlan is looking fine and a good deal older than he did several years ago. — "Working as metallurgist with Pittsfield G. E. on varied developmental and production problems. Hope the

'gang' is keeping up in the study of natural phenomena." — *Basilio*. "What's the matter? Two married and . . . ! Bob Canning is with American Steel and Wire Company at Worcester, Mass. Lou O'Malley is back or rather still here for his S. M. in mining. Max Kessler is with the Carnegie Steel Company at Homestead, Pa. His address is 311 Ninth Avenue, Homestead, Pa." — *George Swift*. Thanks for the criticism, George, maybe the depression had something to do with it.

"I'm still working for the institute downstairs in the radiation measurements lab. I saw Max a few days before Christmas. One thing George forgot to mention was the cute moustache Max has cultivated." — *Johnnie Kolligian*. "Still able to stagger from hither to yon and back again. Would like to see some of you fellows. If you aren't too darn busy why not drop a line c/o Sprague Specialties Company, North Adams, Mass." — *Joe Collins*. "Working as chemist for American Briquet Company, Charlestown, Mass. Say, fellows, how about getting big hearted and dropping a fellow a line." — *Jimmie Mitchell*. "Having a great time in the middle west. Expect an M. S. soon and am planning on staying for a Ph.D. I am learning the gentle art of pulp and paper making, also beer guzzling." — *Harold Bialkowsky*. Harold's address is: Institute of Paper Chemistry, 213 Brokaw Hall, Appleton, Wis. To fix the above information chronologically it was received in January of this year. Maybe I'm being a bit too previous, but nevertheless best wishes to all for the summer. — CHARLES E. BERRY, *Secretary*, 409 West 22d Street, Wilmington, Del.

1929

A picture of a man talking to himself as Walter Winchell would say in his very popular column: "Wonder if the boys will loosen up with a bit of news now and then this Spring. No more issues before June and that makes another year since those good old days at the Institute. Perhaps a few more active course secretaries should be appointed to replace those who have never even dropped a line these last 22 months. It's a good thing the Alumni Association subscribes to that newspaper clipping bureau or class news would be very slender and cramped most of the time. If Mrs. Glen did not remind me of my duties and the due dates on material for publication, now and then, I might get the same inclination to continue to put off my writing for another month. Every time that lazy streak appears she applies that treatment so thoughtfully specified by Dick Boyer on our Class Day platform. Those long tacks are great agitators. Must send one to Dick. Might at least draw him out of his shell."

Fish Hills, XV, heads the news in the rôle of proud father of a baby boy, Frederick A., born on November 21. Fish is now working with the Dewey and Almy Chemical Company of Cambridge. We all congratulate Mr. and Mrs. Hills and wish them much health and happi-

1929 Continued

ness. — Mrs. R. G. Van Wagenen (Ruth Davies, V) shares the headlines in these notes in proudly announcing the birth of a daughter, Joan Eyre, on January 27. We join in congratulating Ruth and her husband and in wishing them much happiness and good health.

Glenn Andrews, X, has also given his boss an excellent opportunity to congratulate him and add a few more dollars to his salary at the same time, if Shell of Hammond, Ind., does such things. Glenn's engagement to Elizabeth Brauer of Hammond was announced January 21. The marriage date was set as February 14, 1931, Valentine's Day. Congratulations and best wishes for future happiness is our message. — Ralph Crosby and Glenn have been working on a two year training course for Shell in East Chicago covering all phases of refining operation. It is just about completed and Larry Tufts, X, will tell you a little further news on Tacks and Glenn.

Since Larry Tufts takes such an interest in his Course X classmates, he should make a good secretary for that Course. Dating from this issue he is hereby appointed to take over the duties of Course X Secretary. — EARL W. GLEN, *General Secretary*, 415 Hillwood Drive, Akron, Ohio.

COURSE X

Glenn Andrews after long silence finally let me know that he was to marry Miss Elizabeth Brauer of Hammond on February 14. As far as I can discover, congratulations are in order. In spite of the vicissitude of the oil industry, he has graduated from the famous Ford of Tech days to a Whippet in which he has covered some 7,000 miles in the last six months. Wonder whether such travel was a necessary preamble to the event on the 14th. Glenn and Tacks Crosby have been working together at the Shell plant in Hammond. Tacks is breaking in as cracking plant inspector.

Ken Beardsley from the Pittsfield G. E. implies that his correspondence is not exactly of the 60 cycle variety, "You needn't get a pin to stick into yourself — I am really writing a letter. Buzzed around in the new Ford last summer but only got as far as New Jersey. (Wonder whether Prunes Meisner is still there?) . . . managed to get the company to appropriate \$7,000 for more equipment." (Too bad we didn't make him a salesman of Voo Doo or Technique back at the Institute with that ability.)

Al Hayes and "Webster Leroy Mac-kusick" are enjoying life at the Whiting plant, Standard of Indiana. Al has purchased or is reported to have a new Oldsmobile. Perhaps it may be possible to make that trip to Boston in less than the two days required last Christmas. —

Ran into Harold Straat at the University of Rochester. He is working at Bausch and Lomb and is taking the same course in Optics at the University of Rochester, as myself. There are about ten more lectures so that with reasonable luck we may see more of each other.

Dick Opper doesn't tell us much about his activity except that he is now in charge of his lab at the U. S. Rubber Company in Passaic, N. J. — Willard Robinson was at the time of the last authentic information still making long non-stop trips from the Standard of New Jersey plant in a new Ford. — Johnnie Happel is at the Standard of New York plant. He has really been quite independent about it. Told them he simply couldn't start work until he had been to Europe. He was over there three months this summer.

For a short time Web Fisher, Honest John Trahey and I were living together in Rochester. However, Web slipped home at Christmas time and returned with his wife, formerly Miss Esther Crandall of Providence. Web is working in the cotton nitrating department of Eastman Kodak Company. Honest John is becoming more and more honest. At any rate he is in charge of the experimental and control work in the paper mill at the Eastman plant. We understand that his superintendent greeted him the other day "How long have you known my daughter?"

Frank Stratton has an apartment with Phil Taylor '28. Frank is continuing his music at the Eastman School of Music. Phil is working with Web Fisher at Kodak Park, as the plant is known here. I am working at the Eastman plant in the paper sensitizing department. The work is interesting and as a general rule the men in the plant are a mighty nice bunch of fellows. That seems to be rather the general condition throughout the Eastman organization. — LAURENCE T. TUFTS, *Secretary*, 178 Alameda Street, Rochester, N. Y.

COURSE XI

The bi-annual letter from Hank Giles prompts this, the second account of the vagrancies of the world's midget course. Hank doesn't unload any of those deep secrets that undoubtedly have crept up upon him after dark, so I am a little doubtful whether he should be given space or not. Anyhow he is still working for the State Department of Health of the Commonwealth of Connecticut. He claims loyalty to all meetings involving the Institute that occur in the neighborhood and recounts several meetings with fellow Tech men which shall be duly passed on. As a last word for Hank, his address is 40 Goshen Street, Hartford, Conn.

In order to make this a 100% report, the following suppositions will be briefly executed. Ed Roche, of vocal fame, should still be at the Institute passing on a little of his accumulated knowledge before he forgets it. His new home address is 60 Edwin Street, Dorchester, Mass. Jack Butler, who used to cut Heat classes was seen at Bridgeport, Conn., at some time in the past and at the present moment is rumored to be searching for new and richer fields of endeavor. As for another one-sixth of the membership a story has been circulated that Saavedra is pleasure tripping in France. Who knows, it sounds good.

The following flashes will be moved on as I interpret them from Hank's flowing hand. Robert Gray, Jr., is working with his father; Donald Hersey with Pratt and Whitney; J. M. Thomas is in an unknown capacity and George Mangurian '28 is with Chance-Vought Aircraft, each and all in Hartford. Norman Wickerstrand, II, used to be in Hartford also, but is now reported to be at home in Meriden, Conn., looking things over. Put Cilley, VI, is working in Boston while living at home in Salem.

As for myself, many changes in habitat with no change in employer have occurred during the past two years. The Chicago Bridge and Iron Works (wanta buy a tank?) is still the patient sufferer. Anyhow I wore dirty clothes while watching field erection of tanks for six months in Hammond, Ind., and Wood River, Ill. Then came semi-dirty clothes and a bathing suit for three months while observing how hot is gasoline in Florida. Interspersed with this were trips through all of the eastern half of the United States on general principles. Saw those fine young men, Bob Philippe and Steve Dilworth each time New York was reached.

I reached our new plant in Birmingham six months ago, thereby achieving a two years' ambition of desiring to join forces with that Beta deluxe, Mace Smith, who though working for the same company had previously been separated by a few thousand miles. Had one real time with Mace. We gave the Institute a thorough cleansing each week. Anyone wishing to congratulate Mace on continued health can do so by addressing him at 1500 N. 50th Street, Birmingham, Ala. At present I am back in Chicago on some new work with prospects of spending most of the summer nights on Pleasant Breeze or some other terribly named pullman car. — LAWRENCE C. HAMLIN, *Secretary*, 1305 W. 105th Street, Chicago, Ill.

Technology Club of Monterrey

The following notes were contributed by Professor Charles E. Locke '96, Secretary of the Alumni Association, and were prepared from letters received from the club.

The Monterrey Club, having organized and elected its officers (Ramon F. Munoz, President, and Bernardo Elosua, Secretary), held its first monthly meeting on February 3, and plans to continue these meetings every month and develop some interesting subject at every meeting. At this first meeting they had as guests: Charles F. Thompson '14, of the Mine and Smelters Supply Company, El Paso, and Marden W. Hayward '06, who as a former resident of Monterrey is still considered to be a member of the club. Official greetings were sent "*muchas saludes y pesetas*," accompanied by the club seal on which were the words "*Carta Blanca Pilsener Mexicana*." The club is securing song books and hopes to develop a real live Technology spirit among its members which number about

15 men in the vicinity of Monterrey. — BERNARDO ELOSUA, '23, *Secretary*, Box 360, Monterrey, N. L., Mexico.

Technology Associaton of North-ern California

A special evening meeting was called for February 5, 1931, to meet R. W. (Bob) Chandler '12, Alumni Council representative of the Pittsburgh, Pa., Technology Club. Dinner was served at the Engineers Club with 22 Tech men in attendance, the range of classes represented being from '92 to '28, inclusive.

Bob was able to give us much information regarding the Institute as it now is, together with an outline of what Dr. Compton hoped to accomplish within the next few years. We were particularly interested in the proposed changes in the Alumni Council, the meeting being divided as to the desirability of these changes. Our great distance from Cambridge is a handicap to both ourselves and the central Alumni organization. We asked Bob, however, to pass the word around Technology to any Alumni who may be planning a business or pleasure trip to the Pacific Coast to look us up and if at all possible, give us a few days notice so that we may gather the crowd and all get together for a talk. Bob said that he could assure any visiting Alumni that we will show them a good time and won't require any formal speeches in payment. We run on an informal basis at all times and hope that our visitors will feel, when they drop in on us, that they are "one of the crowd."

The question of a more definite form of organization was brought up at this meeting and our President, Jonathan E. Woodbridge '93, appointed a committee to draw up and report on a proposed form with suggestions as to the financing of the Club. This committee is composed of the following Alumni: Forrest G. Harmon '23, Chairman; Robert S. Clark '06, George R. Norton '07, Harry M. Nabstedt '05, and Franklin W. McLaren '25. The attendance at the Tuesday lunches is holding up well. The subjects discussed around the table are as varied as ever. Much pressure is being brought to bear to stage another smoker in the near future. — JOHN K. HELLER, '16, *Secretary*, 562 Sutter St., San Francisco, Calif.

The M. I. T. Club of Western Pennsylvania

On Friday, January 30, the Club held its regular monthly dinner meeting at the University Club in Pittsburgh. With the genial "Rufe" Zimmerman '11, in the presidential chair, and with Frank Chesterman '05, and Maurice R. Scharff '09, scheduled as speakers, a large attendance had been anticipated. Expectations were more than realized, however, the regular "old line" contingent being augmented by many new faces.

All the way from Boston and Worcester came Bob Chandler '12, the Club's representative on the Alumni Council. Whenever Bob descends from the Olympian

heights of the Sacred Cod to the smoky and fiery regions of Pittsburgh, it's something of a gala event for the local Tech men hereabouts. As usual, Bob contributed plenty of fire to the business of the meeting. The Club is indebted to him for a very interesting discussion of the proposed new scheme of alumni representation.

Mr. Scharff, as principal speaker of the evening, presented a résumé of current affairs at the Institute, under the title of "Technology Über Alles." Referring to proposed new dormitories and laboratories, Mr. Scharff read to the Club a letter received from Dr. Compton recently. A report of the last meeting of the Alumni Council was made by Mr. Chesterman, with particular emphasis on the disposition by the Council of the proposed "House of Delegates" plan of alumni representation. Mr. Chesterman also discussed the various phases of the plan in its relation to the local M. I. T. Clubs throughout the country. The meeting was adjourned at 10:15 P.M.

In addition to the above meeting, the Secretary wishes to report also the Club's luncheon for Col. Frank L. Locke '86, Personnel Director of the Division of Industrial Coöperation and Research. The luncheon was held on February 13 at McCreery's Restaurant, Pittsburgh. Col. Locke spoke to the Club informally on the value of coöperation between the Alumni and the Institute, and on the trend of engineering educational methods. — CLARENCE B. ROGERS, '14, *Secretary*, 5839 Beacon Street, Pittsburgh, Pa. S. J. HELEMAN, '24, *Assistant Secretary*, 435 Sixth Avenue, Pittsburgh, Pa.

Technology Club of Hartford

The following letter was sent to The Review Office by Alan W. Crowell '25:

"It has just come to my attention that the meetings of the Hartford Technology Club have not been reported in The Review. The meetings which we have held during the 1930-31 season have been extremely interesting and worth while and perhaps some of the plans which we have carried out may give other Alumni groups ideas for their own gatherings.

"The first meeting of the 1930-31 season was held Thursday evening, October 30, at the Oasis Club in East Hartford which is directly across the Connecticut River from Brainerd Field, the well-known Hartford Airport. Thirty-four men were present and all agreed that the delicious steak dinner for which the club is famous was certainly worth the trip. The ping-pong tournament which was in progress before and after the dinner and meeting, furnished plenty of amusement and interest for both players and gallery.

"The sole objective of the meeting following the dinner was to give the club members an opportunity for expressing their ideas on the type of program which would be enjoyable and worth while and of interest to the greatest number. The ideas presented at this meeting have formed the basis for the Club program which has been in progress during the

winter months. Perhaps the most drastic change from former years is the elimination of luncheon meetings. It was decided that one carefully planned evening meeting a month would be much more feasible and would make it possible for larger groups to attend.

"The second meeting (the first in the new era) was held on Thursday evening, December 4, and a larger crowd turned out than had ever been in attendance at any previous meeting of the Hartford Technology Club. The program which was responsible for the record attendance started with bowling at 6:00 P.M. followed by dinner at 8:00 P.M. The main feature of the evening was the talk by Professor Erwin H. Schell '12 who is head of the course in Business and Engineering Administration. Professor Schell's subject was 'Vitaminic Qualities in Management.' The attentive interest of the entire group was quite evident while Professor Schell described 'certain vitaminic qualities which he has found to be inherent in really successful people.'

"The very interesting ideas which he discussed have also been the subject of many of the live and inspiring messages which he periodically writes to the graduates of Course XV. The messages had aroused such tremendous interest among Course XV men that the Hartford Club was indeed pleased to be able to hear the messages vitalized by Professor Schell's charming personality.

"The third meeting was held on January 15 at the Hartford City Club and was called the Aircraft Meeting because the large group of men from the Pratt and Whitney Aircraft Company and the Chance-Vought Corporation provided the program. Forty-nine men were present — another record attendance. By some very special arrangement Charles J. McCarthy '16 of the Chance-Vought Corporation was able to procure movies of the Naval Air Forces in action. It was a real treat to see operations aboard one of the Navy's new Aircraft Carriers, especially since the movies are the type that are not ordinarily shown outside of official circles. Mr. Charles H. Chatfield '14 of the United Aircraft and Transport Company told a very interesting story about the part that Hartford and the State of Connecticut are playing in the development of aeronautics. Mr. Chatfield was formerly professor of Aeronautics at the Institute.

"The most recent meeting, held on Saturday, March 7, was of great interest because President Karl T. Compton and Dean Harold E. Lobdell '17 were guests of honor and both spoke informally. Technology Alumni from all parts of the State of Connecticut and from Springfield, Mass., were invited to be the guests of the Hartford Club for the opportunity of meeting Dr. Compton and Dean Lobdell. An indoor golf tournament and informal reception were started at 3:00 P.M., and continued until time for dinner at 6:30. A championship team match was played between the New Haven-Waterbury Club and the Hartford Club. The Hartford Club won three up. Francis E. Stern

'16 won the first prize for the lowest individual score and George I. Emerson '09 won second prize.

"Interest in the meeting and the chance to meet the two men from the Institute is shown by the fact that 96 men were in attendance. Dean Lobdell was introduced by his fraternity brother Samuel E. Rogers '13 of the Hartford Club. His remarks were about the many interesting things that are happening in undergraduate activities, especially concerning the Dormitory building program.

"Professor Hudson B. Hastings '07 of the New Haven Club, introduced Dr. Compton in a very appropriate manner. These two men were on the faculty at Reed College in Portland, Ore., some 15 years ago and had not seen each other since that time. The meeting offered an excellent opportunity for renewing their acquaintance. Dr. Compton described the new buildings under construction at the Institute and summarized briefly various other Institute activities and problems. The visit from President Compton and Dean Lobdell was very much enjoyed and the meeting sets a standard that will be hard to surpass.

"The Club officers most active this season are: Everett O. Hiller '04, President; Alan W. Crowell '25, Vice-President; Robert H. Mather '11, Secretary; and Samuel E. Rogers '13, Board of Governors." — ROBERT H. MATHER, '11, Secretary, 51 Elm Street, Windsor Locks, Conn.

M. I. T. Club of the Mohawk Valley

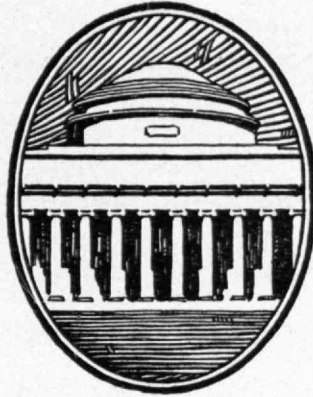
Edwin A. Gruppe sent in the following notes: On the occasion of the visit of Dr. Tryon to Utica on March 9, the M. I. T. Club of the Mohawk Valley gathered for an informal dinner at the University Club. Dr. Tryon told of recent developments at the Institute, including plans for the new physics and chemistry building and the new dormitories; the new courses in Business and Engineering Administration, Aeronautical Engineering and Fuel and Oils. The desirability of contacting the students at high schools and academies with a view of interesting them in the work at Technology was discussed.

This meeting was made the occasion for the election of officers and the following were elected for the year: President,

Edwin A. Gruppe '22; Vice-President, Clarence B. Williams '04; Secretary-Treasurer, Eric L. Etherington '20.

Fate played against us on attendance, five members being unable to attend due to business engagements and a sixth was held out by illness. Those present, however, enjoyed the meeting and after discussion during which records of friends and acquaintances in and around Boston were brought up to date, the meeting adjourned. Those present were Dr. Tryon, Wheaton I. Griffin, Clarence B. Williams, Mr. and Mrs. Leslie Allen Stewart, Mr. and Mrs. Frank Gilson, and Mr. and Mrs. Edwin A. Gruppe.

The following day Dr. Tryon visited Rome and interviewed several students at the Rome Academy. Assemblies were arranged at the Utica Free Academy and the Herkimer High School at which Dr. Tryon addressed approximately 1,200 students. After these assemblies, further details were discussed with those more particularly interested. We feel certain that Dr. Tryon's visit did much for Technology. — ERIC L. ETHERINGTON, '20, Secretary, Bonbright and Company, 1214 First Bank Building, Utica, N. Y.



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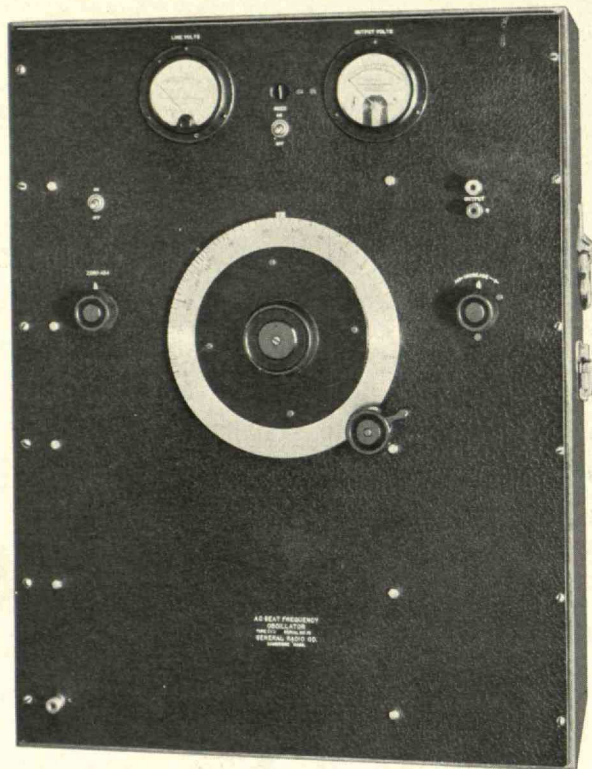
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